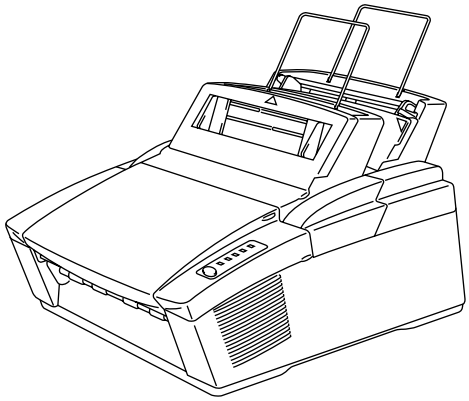
Please read this manual thoroughly before using the printer.

Brother Laser Printer

HL-1070

User's Guide



Keep this manual in a convenient place for quick and easy reference at all times.

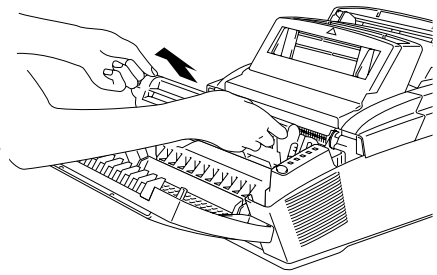
Shipment of the Printer

If for any reason you must ship your printer, carefully package the printer to avoid any damage during transit. It is recommended that you save and use the original packaging. The printer should also be adequately insured with your carrier.

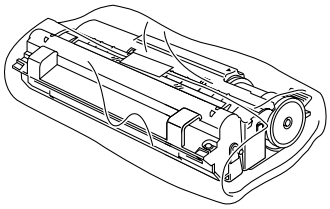
Warning

When shipping the printer, the DRUM UNIT assembly including the TONER CARTRIDGE must be removed from the printer and placed in the plastic bag. **Failure to remove and place it in the plastic bag during shipping will cause severe damage to the printer and will VOID THE WARRANTY.**

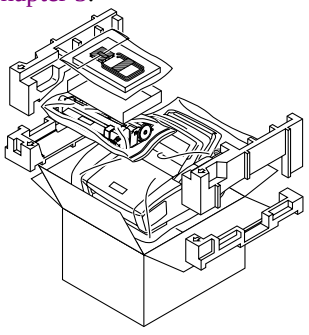
1 Remove the drum unit.



2 Place it in the plastic bag and seal the bag completely.



3 Re-pack the printer.
See “REPACKING THE PRINTER” in Chapter 5.



Laser Printer HL-1070 Series User's Guide

(For USA & CANADA Only)

For technical and operational assistance, please call:

In USA	1-800-276-7746	(outside California)
	714-859-9700 Ext. 329	(within California)
In CANADA	1-800-853-6660	
	514-685-6464	(within Montreal)

If you have comments or suggestions, please write us at:

In USA	Printer Customer Support Brother International Corporation 15 Musick Irvine, CA 92718
In CANADA	Brother International Corporation (Canada), Ltd. - Marketing Dept. 1, rue Hôtel de Ville Dollard-des-Ormeaux, PQ, Canada H9B 3H6

BBS
For downloading drivers from our Bulletin Board Service, call:

In USA	1-888-298-3616
In CANADA	1-514-685-2040

Please log on to our BBS with your first name, last name and a four digit number for your password. Our BBS supports modem speeds up to 14,400, 8 bits, no parity, 1 stop bit.

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Brother Customer Service has installed an easy to use Fax-Back System so you can get instant answers to common technical questions and product information for all Brother products. This is available 24 hours a day, 7 days a week. You can use the system to send the information to any fax machine, not just the one you are calling from. Please call 1-800-521-2846 (USA) or 1-800-681-9838 (Canada) and follow the voice prompts to receive faxed instructions on how to use the system and your index of Fax-Back subjects.

DEALERS/SERVICE CENTERS (USA only)
For the name of an authorized dealer or service center, call 1-800-284-4357.

SERVICE CENTERS (Canada only)
For service center addresses in Canada, call 1-800-853-6660

INTERNET ADDRESS
For technical questions and downloading drivers: **http://www.brother.com**

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The contents of this manual and the specifications of this product are subject to change without notice.

Brother reserves the right to make changes without notice in the specifications and materials contained herein and shall not be responsible for any damages (including consequential) caused by reliance on the materials presented, including but not limited to typographical and other errors relating to the publication.

This product is designed for use in a Professional Environment.

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Definitions of Warnings, Cautions, and Notes

The following conventions are used in this User's Guide:

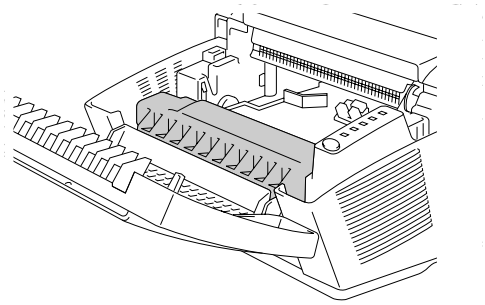
> **⚠ Warning**
> **Indicates warnings that must be observed to prevent possible personal injury.**

> **Caution**
> Indicates cautions that must be observed to use the printer properly or prevent damage to the printer.

> **Note**
> Indicates notes and useful tips to remember when using the printer.

To Use the Printer Safely

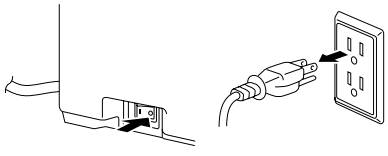
> **⚠ Warning**
> **After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.**



⚠ High Temperature

Inside the Printer

> **⚠ Warning**
> **There are high voltage electrodes inside the printer. Before cleaning the printer, make sure to turn off the power switch and unplug the power cord from the power outlet.**



Turning off the Switch and Unplugging the Printer

TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION 1–1

ABOUT THE GUIDEBOOKS 1–1
Finding Out How to Use the Printer 1–1
ABOUT YOUR PRINTER 1–2
Printer Overview 1–2
System Requirements in the Brother Printing Solution for Windows 1–3
Features 1–3
OPERATING AND STORAGE ENVIRONMENT 1–6
Power Supply 1–6
Environment 1–6

CHAPTER 2 PAPER HANDLING 2–1

PAPER SPECIFICATIONS 2–1
MULTI-PURPOSE SHEET FEEDERS 2–4
Loading Paper into the Feeder 2–5
Two Side Printing (Manual Duplexing) 2-8
MANUAL FEED SLOT 2-9
OUTPUT TRAY AND PAPER SUPPORT WIRE 2–11

CHAPTER 3 CONTROL PANEL 3–1

LAMPS AND SWITCH 3–1
Ready (Paper) Lamp 3–1
Data (Toner) Lamp 3–2
Drum Lamp 3– 2
Feeder Lamp 3– 2
Alarm Lamp 3– 3
Switch 3–3
Other Control Features 3–4
Sleep Mode 3–4
Test Print Mode 3–4
Control Features Set by the Brother Driver 3–5
Page Protection 3–5
APT (Advanced Photoscale Technology) 3–6

CHAPTER 4 OPTIONS 4–1

SERIAL INTERFACE BOARD RS100M 4–1
Selecting the RS-422A (Apple) or RS-232C (IBM) Serial Interface 4–1
Setting the Serial Interface Parameters 4–2
Connecting the Serial Interface Cable 4–4
ADDITIONAL MEMORY 4–6
Installing the SIMM 4–7

CHAPTER 5 MAINTENANCE 5–1

REPLACING THE TONER CARTRIDGE 5–1
REPLACING THE DRUM UNIT 5–6
ADJUSTING THE PRINT DENSITY 5–10
CLEANING THE PRINTER 5–11
Cleaning the Printer Exterior 5–11
Cleaning the Printer Interior and Drum Unit 5–12
Cleaning the Paper Feed Rollers 5–15
RE-PACKING THE PRINTER 5–16

CHAPTER 6 TROUBLESHOOTING 6–1

ALARM INDICATIONS AT A GLANCE 6–1
Operator Calls 6–1
Service Calls 6–4
PAPER JAMS 6–5
Q & A 6–9
Setting Up the Printer Hardware 6–9
Setting Up the Printer for Windows 6–10
Setting Up the Printer for DOS 6–11
Setting Up the Printer for Apple Macintosh Computers 6–12
When Using the Optional RS-100M Serial Interface 6–12
Paper Handling 6–13
Printing 6–14
Print Quality 6–15

APPENDIX A A–1

PRINTER SPECIFICATIONS A–1
Printing A–1
Functions A–2
Electrical and Mechanical A–3
PARALLEL INTERFACE SPECIFICATIONS A–4
UNIVERSAL SERIAL (USB) INTERFACE A-6
RESIDENT FONTS A–7
75 Scalabele and 12 Bitmapped Fonts A–7
SYMBOL SETS/CHARACTER SETS A–9
OCR Symbol Sets A–9
HP LaserJet 6P Mode A–9
EPSON Mode A–9
IBM Mode A–9

INDEX Index–1

REGULATIONS

Federal Communications Commission(FCC) Declaration of Conformity (For USA Only)

Responsible Party : Brother International Corporation
100 Somerset Corporate Boulevard
Bridgewater, NJ 08807-0911, USA
TEL : (908) 704-1700

declares, that the products

Product Name : Brother Laser Printer HL-1070
Model Number : HL-1060
Product Options : ALL

complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Important

A shielded interface cable should be used in order to ensure compliance with the limits for a Class B digital device.
Changes or modifications not expressly approved by Brother Industries, Ltd. could void the user's authority to operate the equipment.

Industry Canada Compliance Statement (For Canada Only)

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur la matériel brouilleur du Canada.

International Energy Star Compliance Statement

The purpose of the International Energy Star Program is to promote the development and popularization of energy-efficient office equipments, which includes computers, monitors, printers, facsimile receivers and copy machines world-wide.
As an International Energy Star partner, Brother Industries, Ltd. has decided that this product meets the guideline of the program.

Radio Interference (220-240 V Model Only)

This printer complies with EN55022(CISPR Publication 22)/Class B.

Before this product is used, ensure that you use a double-shielded cable with twisted-pair conductors and that it is marked "IEEE 1284 compliant". The cable must not exceed 1.8 meters in length.

Laser Safety (For 110–120 V Model Only)

This printer is certified as a Class I laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

FDA Regulations (For 110-120 V Model Only)

U.S. Food and Drug Administration (FDA) has implemented regulations for laser products manufactured on and after August 2, 1976. Compliance is mandatory for products marketed in the United States. One of the following labels on the back of the printer indicates compliance with the FDA regulations and must be attached to laser products marketed in the United States.

MANUFACTURED:
BROTHER INDUSTRIES (USA) INC.
2950 Brother Blvd., Bartlett, TN 38133, U.S.A.
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

MANUFACTURED:
BROTHER INDUSTRIES LTD.
15-1 Naeshiro-cho Mizuho-ku Nagoya, 467-8561 Japan
This product complies with FDA radiation performance standards, 21 CFR Subchapter J

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

Declaration of Conformity (For Europe)

We, Brother International Europe Ltd.,
Brother House 1 Tame Street, Guide Bridge, Audenshaw, Manchester M34 5JE, UK.

declare that this product is in conformity with the following normative documents.

Safety:	EN 60950,	EN 60825
EMC:	EN 55022 Class B,	EN 50082-1

following the provisions of the Low Voltage Directive 73/23/EEC and the Electromagnetic Compatibility Directive 89/336/EEC (as amended by 91/263/EEC and 92/31/EEC).

Issued by:
Brother International Europe Ltd.
European Technical Services Division

IEC 825 Specification (For 220–240 V Model Only)

This printer is a Class 1 laser product as defined in IEC 825 specifications. The label shown below is attached in countries where required.

This printer has a Class 3B Laser Diode which emits invisible laser radiation in the Scanner Unit. The Scanner Unit should not be opened under any circumstances.

Caution

Use of controls, adjustments or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.

The following caution label is attached near the scanner unit.

CAUTION
INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCK DEFEATED. AVOID DIRECT EXPOSURE TO BEAM. CLASS 3B LASER PRODUCT.
ADVARSEL
USYNLIG LASER STRÅLING NÅR KABINETLÅGET STÅR ÅBENT. UNGDÅ DIREKTE UDSÆTTELSE FOR STRÅLING. KLASSE 3B LASER.
VARNING
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRRAR ÄR URKOPPLADE. STRÅLEN ÄR FARLIG. KLASS 3B LASER APPARAT.
VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN. LUOKAN 3B LASERLAITE.
ADVARSEL
USYNLIG LASERSTRÅLING.UNNGÅ DIREKTE KONTAKT MED LASERENHETEN NÅR TOPPDEKSELET ER ÅPENT. KLASSE 3B LASERPRODUKT.
ATTENTION
RADIATIONS LASER INVISIBLES QUANDOUVERT ET VERROUILLAGE ENLEVE. EVITER EXPOSITIONS DIRECTES AU FAISCEAU. PRODUIT LASER CLASSE 3B.
VORSICHT
UNSICHTBARE LASERSTRAHLUNG WENN ABDECKUNG GEÖFFENT UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT. NICHT DEM STRAHL AUSSETZEN. SICHERHEITSKLASSE 3B.
ATENCIÓN
RADIACIÓN LASER INVISIBLE CUANDO SE ABRE LA TAPA Y EL INTERRUPTOR INTERNO ESTÁ ATASCADO. EVITE LA EXPOSICIÓN DIRECTA DE LOS OJOS. PRODUCTO LASER CLASE 3B.

For Finland and Sweden
LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

Varoitus! Laitteen käyttäminen muulla kuin tässä käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

Varning – Om apparaten används på annat sätt än i denna Bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

IMPORTANT - For Your Safety

To ensure safe operation the three-pin electrical plug supplied must be inserted only into a standard three-pin power point which is properly grounded through normal household wiring.

Extension cords used with the equipment must be three-pin plug type and correctly wired to provide proper grounding. Incorrectly wired extension cords may cause personal injury and equipment damage.

The fact that the equipment operates satisfactorily does not imply that the power is grounded and that the installation is completely safe. For your safety, if in any doubt about the effective grounding of the power, consult a qualified electrician.

Disconnect device

This printer must be installed near a power outlet, which is easily accessible. In case of emergencies, you must disconnect the power cord from the power outlet in order to shut off power completely.

Geräuschemission / Acoustic Noise Emission (For Germany Only)

Lpa < 70 dB (A) DIN 45635-19-01-KL2

IMPORTANT - Wiring Information (For U.K. only)

If the power cord supplied with this printer is not suitable for your electrical outlet, remove the plug from the mains cord and fit an appropriate three pin plug. If the replacement plug is intended to take a fuse then fit the same fuse as the original.

If a moulded plug is severed from the power cord then it should be destroyed because a plug with cut wires is dangerous if plugged into a live socket outlet. Do not leave it where a child might find it.

In the event of replacing the plug fuse, fit a fuse approved by ASTA to BS1362 with the same rating as the original fuse.

Always replace the fuse cover. Never use a plug with the cover omitted.

WARNING - THIS PRINTER MUST BE PROPERLY EARTHED.

The wires in the mains cord are coloured in accordance with the following code:

Green and yellow:	Ground
Blue:	Neutral
Brown:	Live

The colours of the wiring in the power lead of this printer may not correspond with the markings which identify the terminals in your plug. If you need to fit a different plug, proceed as follows.

Remove a length of the cord outer sheath, taking care not to damage the coloured insulation of the wires inside.

Cut each of the three wires to the appropriate length. If the construction of the plug permits, leave the green and yellow wire longer than the others so that, in the event that the cord is pulled out of the plug, the green and yellow wire will be the last to disconnect.

Remove a short section of the coloured insulation to expose the wires.

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter “E” or by the earth symbol or coloured green or green and yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter “N” or coloured black or blue.

The wire which is coloured brown must be connected to the terminal which is marked with the letter “L” or coloured red or brown.

The outer sheath of the cord must be secured inside the plug. The coloured wires should not hang out of the plug.

CHAPTER 1
INTRODUCTION

ABOUT THE GUIDEBOOKS

Finding Out How to Use the Printer

You have two guidebooks for this printer. Read each guidebook in the following order:

1. Read the Quick Setup Guide to set up your printer and to ensure proper connection with your computer. It also contains information for installing the printer driver, fonts and Remote Printer Console Program.

2. Read the User's Guide to get information about the following.

- Features and operating environment requirements of your printer – Chapter 1
- Paper Handling – Chapter 2
- Control Panel – Chapter 3
- Options – Chapter 4
- Maintenance – Chapter 5
- Troubleshooting – Chapter 6
- Specifications – Appendices
- Index

ABOUT YOUR PRINTER

Printer Overview

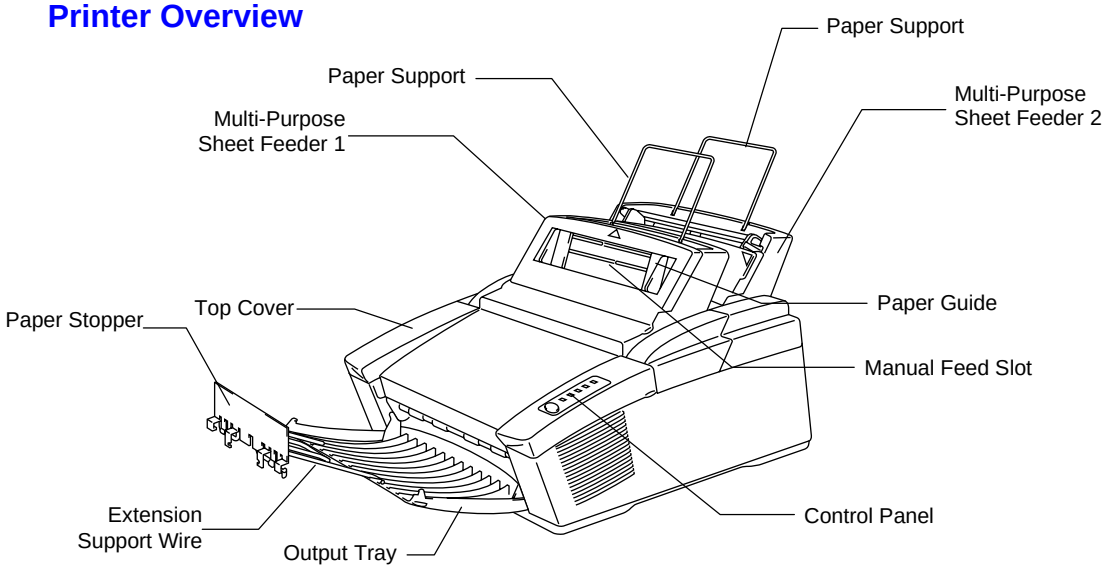


Fig. 1-1 Front View

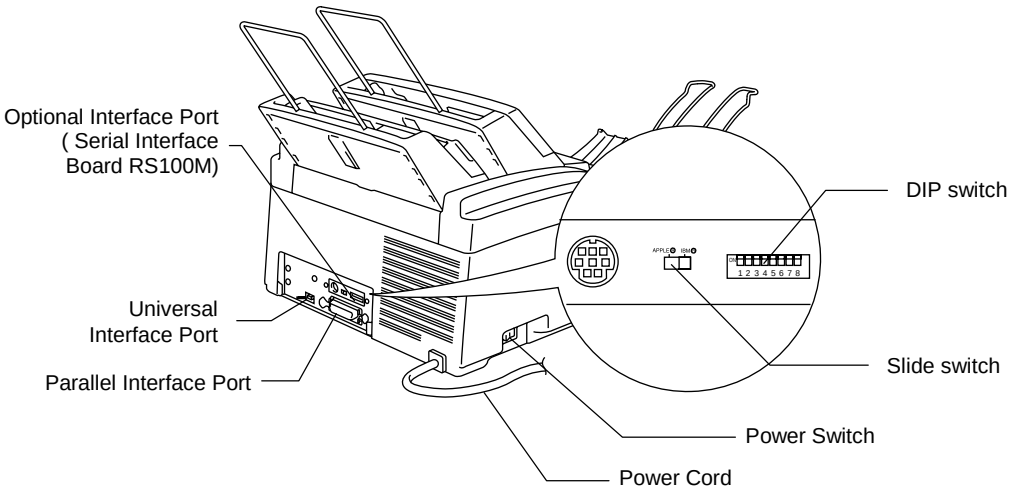


Fig. 1-2 Rear View

System Requirements in the Brother Printing Solution for Windows

Check the following system requirements to setup and operate the printer in the Brother Printing Solution for Windows environment:

- IBM PC or compatible with 80486 SX or higher microprocessor
- Parallel interface (or printer port)
- 4 MB or more of memory (8 MB recommended)
- 10 MB of space available on your hard disk for the printer driver and all fonts
- Microsoft Windows 95/98 , Windows NT 4.0 or Windows 3.1/3.11

Features

This printer has the following features:

❑ **Up to 1200 (H) x 600 (V) dpi Resolution and 10 ppm Printing Speed**
True 600 dots per inch (dpi) with microfine toner and ten pages per minute (ppm) printing speed (A4 or Letter paper). This printer also supports 1200 (H) x 600(V) dots per inch (dpi) resolution for Windows DIB (Device Independent Bitmap) graphics. (It is recommended to add memory when printing in 1200 x 600 dpi mode.)

❑ **Versatile Paper Handling**
The printer has two multi-purpose sheet feeders and a straight paper path mechanism.
From the front Feeder 1 you can load A4, letter, legal, B5, A5, A6 and executive sizes of paper, and various types of paper including envelopes, postcards, organizer paper, and your custom paper size. From the rear Feeder 2 you can load A4, letter, legal, B5, and executive sizes of paper. The front Feeder 1 also allows manual paper loading, so you can also use labels and transparencies.

❑ **Enhanced Printing Performance and User-Friendly Operation for Windows**
The dedicated printer driver and TrueType-compatible fonts for Microsoft Windows 95/98 and Windows 3.1 are available on the floppy disk supplied with your printer. You can easily install them into your Windows system using our installer program. The driver supports our unique compression mode to enhance printing speed in Windows applications and allows you to choose various printer settings including toner saving mode, custom paper size, sleep mode, gray scale adjustment, resolution and so forth. You can easily set these print options through the Printer Setup Menu within the Windows Control Panel.

❑ **Remote Printer Console Program for DOS**
The utility program, Remote Printer Console (RPC), is available on a floppy disk supplied with your printer. When you operate your computer in the DOS (Disk Operating System) environment, this program allows you to easily change the default settings of the printer such as fonts, page setup, emulations and so on.
This program also provides a status monitor program, which is a Terminate-and-Stay Resident (TSR) program. It can monitor the printer status while running in the background and report the current status or errors on your computer screen.

❑ **Popular Printer Emulation Support**
This printer supports four popular printer emulation modes, HP LaserJet 6P, Brother BR-Script Level 2, Epson FX-850 and IBM Proprinter XL. When you use DOS application software or Windows version 3.0 or earlier, you can use any of these emulations to operate the printer. The printer also supports auto-emulation switching between HP, BR-Script 2 and Epson or HP, Brother BR-Script 2 and IBM. If you want to select the printer emulation, you can do it using the Remote Printer Console Program.

❑ **Two Interfaces**
This printer has a high speed bi-directional parallel interface, and a Universal Serial Bus (USB).

If your application software supports the bi-directional parallel interface, you can monitor the printer status. It is fully compatible with the industry-standard bi-directional parallel interface.

The Universal Serial Bus is an interface which allows the printer to be connected to multiple peripheral devices.

The printer status monitor program can show the current status of your printer. When printing, the animated dialog box appears on your computer screen to show the current printing process. If an error occurs, a dialog box will appear to let you know what to correct. For example: when your printer is out of paper, the dialog box will display "Paper Empty" and instructions for the proper corrective action.

❑ **High Resolution Control & Advanced Photoscale Technology**
High resolution control (HRC) technology provides clear and crisp printouts. Use this function to get smooth text print quality. Advanced Photoscale Technology enables the printer to print graphics in 256 grayscale levels, producing nearly photographic quality. Use this function when you want to print photographic images.

- **Enhanced Memory Management**
  The printer provides its own data compression technology in the printer hardware and the supplied printer driver software, which can automatically compress graphic data and font data efficiently into the printer's memory. You can avoid memory errors and print most full page 600 dpi graphic and text data, including larger fonts, with the printer's standard memory.

- **Environment-Friendly**
  Economy Printing Mode
  This feature will cut your printing cost by saving toner. It is useful when you want to obtain draft copies for proof-reading. You can select from two economy modes — 25% toner saving and 50% toner saving — through the Windows printer driver supplied with your printer.

  Sleep Mode (Power Save Mode)
  When the printer is not used for a certain amount of time, sleep mode automatically reduces power consumption. The printer consumes less than 13 W when in sleep mode.

  Low Running Cost
  Since the toner cartridge is separate from the drum unit, you need to replace only the toner cartridge after approximately 2,400 pages, which is cost effective and ecologically friendly.
  The actual number of pages printed with each toner cartridge may vary depending on your average type of print job.

OPERATING AND STORAGE ENVIRONMENT

Please take note of the following before using the printer.

Power Supply

Use the printer within the specified power range.

AC power:	±10% of the rated power voltage in your country
Frequency:	50 Hz (220 V– 240 V) or 50/60 Hz (110–120 V)

The power cord, including extensions, should not exceed 5 meters (16.5 feet).

Do not share the same power circuit with other high-power appliances, particularly an air conditioner, copier, shredder and so on. If it is unavoidable that you must use the printer with these appliances, it is recommended that you use an isolation transformer or a high-frequency noise filter.

Use a voltage regulator if the power source is not stable.

Environment

The printer should be installed near a power outlet, which is easily accessible.

Use the printer only within the following ranges of temperature and humidity.

Ambient temperature:	10°C to 32.5°C (50°F to 90.5°F)
Ambient humidity:	20% to 80% (without condensation)

The printer should be used in a well ventilated room.

Place the printer on a flat, horizontal surface.

Keep the printer clean. Do not place the printer in a dusty place.

Do not place the printer where the ventilation hole on the right hand side of the printer is blocked.

Do not place the printer where it is exposed to direct sunlight. Use a blind or a heavy curtain to protect the printer from direct sunlight when the printer is unavoidably set up near a window.

Do not place the printer near devices that contain magnets or generate magnetic fields.

Do not subject the printer to strong physical shocks or vibrations.

Do not expose the printer to open flames or salty or corrosive gases.

Do not place objects on top of the printer.

Do not place the printer near an air conditioner.

Keep the printer horizontal when carrying.

Do not cover the slots in the top cover.

CHAPTER 2
PAPER HANDLING

PAPER SPECIFICATIONS

The multi-purpose sheet feeders can handle paper that has the following specifications.

❑ Sheet Feeder 1 (Front) / Manual slot

Paper Type	Paper Size
Cut sheet	A4, Letter, Legal, B5, A5, A6, Executive, Custom size (70-216 x 127-356 mm, 2.75-8.5 x 5-14 inches)
Envelopes	DL, C5, COM-10, Monarch, 9” x 12”, C4
Post Card	70-216 x 127-356 mm, 2.75-8.5 x 5-11 inches
Organizer	Day-Timer® J, K, L, M 70-216 x 127-356 mm, 2.75-8.5 x 5-11 inches
Labels and Transparencies	70-216 x 127-356 mm, 2.75-8.5 x 5-14 inches

❑ Sheet Feeder 2 (Rear)

Paper Type	Paper Size
Cut sheet	A4, Letter, Legal, B5, Executive

	Cut Sheet	Envelope
Basis Weight	60 to 157 g/m^2 (16 to 42 lb.)	75 to 90 g/m^2 (20 to 24 lb.) single thickness
Caliper	±0.03 to ±0.08 in. (0.08 to 0.2 mm)	0.0033 to 0.0058 in. (0.084 to 0.14 mm) single thickness
Moisture Content	4% to 6% by weight	4% to 6% by weight

Paper Capacity in Feeder

Multi-purpose
Sheet Feeder: Up to 22 mm (0.87 inch) in height (up to the mark)
Approx. 200 sheets of 80 g/m^2 (20 lb.) or 30 sheets of 157 g/m^2 (42 lb.) A4/Letter paper, or 10 envelopes
Output Tray: Approx. 100 sheets of 80 g/m^2 (20 lb.) A4/Letter paper

Recommended paper

Cut sheet:	Xerox 4200 (in USA) / Xerox 80 Premier Paper (in Europe) or equivalent
Label:	Avery laser label or equivalent
Transparency:	3M PP2500 / Avery 5282 (in USA) / STABILO 7250 (in Europe) or equivalent

Remarks

It is recommended that you test paper, especially special sizes and types of paper, on this printer before purchasing large quantities.

Avoid feeding labels with carrier sheets exposed (sheets with labels previously removed), or your printer will be damaged.

Avoid using coated paper, such as vinyl coated paper.

Avoid using preprinted or highly textured paper.

Use a recommended type of paper, especially plain paper and transparencies, for optimum printing. For more information on paper specifications, consult your nearest authorized sales representative or the place of purchase of your printer.

We recommend you use label or transparencies which are designed for use in laser printers.

We recommend you use long-grained paper for the best print quality.

If the paper has problems feeding from the multi-purpose sheet feeder, use the manual feed slot and try again.

You can use recycled paper in this printer.

Before using paper with holes such as organizer sheets, you must fan the stack well to avoid paper jams and misfeeds.

Before using any paper, make sure that it is not curled. If it is, you should straighten the paper as much as possible. Feeding curled paper can cause paper jams and misfeeds.

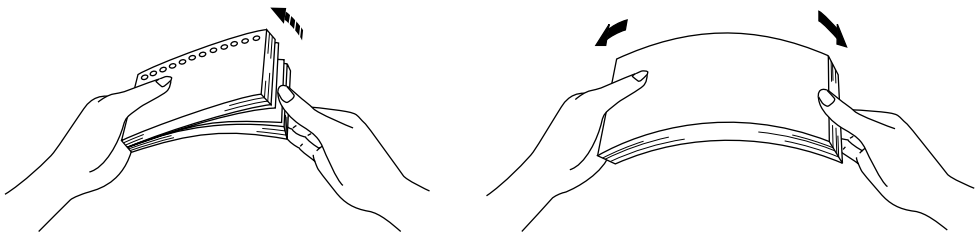


Fig. 2-1 Fan the Paper and Straighten the Paper

The following types of envelopes are not recommended for use.

- Damaged, curled, wrinkled, or irregularly shaped envelopes
- Extremely shiny or highly textured envelopes
- Envelopes with clasps
- Envelopes with self-adhesive closures
- Envelopes of baggy construction
- Envelopes not sharply creased
- Embossed envelopes
- Envelopes already printed by a laser printer
- Envelopes pre-printed on the inside
- Envelopes that cannot be arranged uniformly when placed in a pile

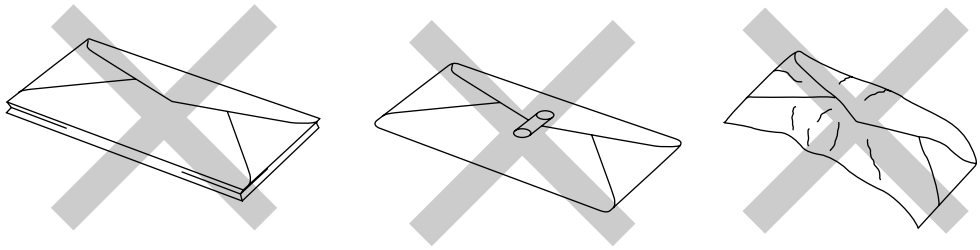
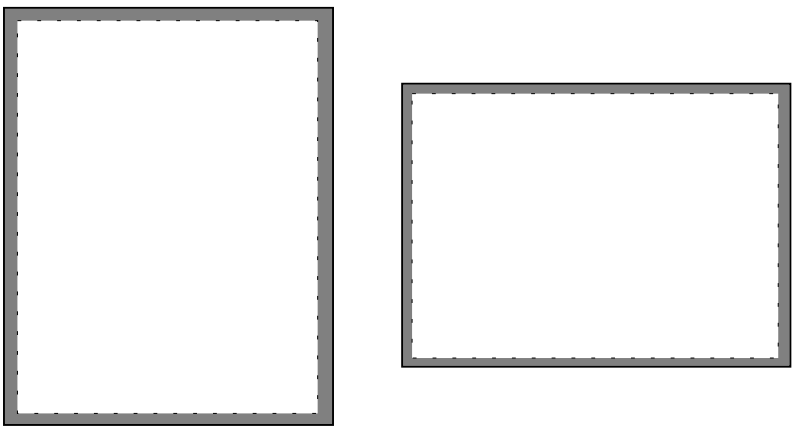


Fig. 2-2 Envelopes

Printable Area The figure below shows the physically printable area. (Except 9”x12” envelope)



Unprintable area
Approximately 4 mm(0.16 inch) for any sizes of paper

Fig. 2-3 Printable Area

MULTI-PURPOSE SHEET FEEDERS

The printer has two multi-purpose sheet feeders that can feed plain paper, envelopes, transparencies and organizer paper.

To use the multi-purpose sheet feeders, follow these steps:

1. Make sure that you have selected the proper paper source, paper size and orientation.

> **Note**
> - You may select the proper paper source, paper size, and orientation in your application software.
> - If your application software does not support your custom paper size, select the next paper size up that is closest but larger than the custom size. Then adjust the print area by changing the right and left margins in your application software.

2. Make sure that the multi-purpose sheet feeder contains the selected size of paper in the selected orientation. If necessary, change the paper in the feeder.

3. Send your file or document to the printer.

   When the printer receives data, it begins the print process by loading paper from the multi-purpose sheet feeder. If the printer is in sleep mode when it receives data, it will wake up and start the printing process automatically.

Loading Paper into the Feeder

To load paper into the feeder, follow these steps.

> **Note**
> This section describes loading paper into the front multi-purpose sheet feeder 1. Load paper into the rear sheet feeder 2 in the same way as described here. Remember, however, that paper sizes vary for Feeder 1 and Feeder 2. For paper sizes, see "PAPER SPECIFICATIONS" in Chapter 2.

1. Open the multi-purpose sheet feeder by gently pulling the tabs forward towards you. (①)
2. Move the paper guides horizontally to the widest position. (②)

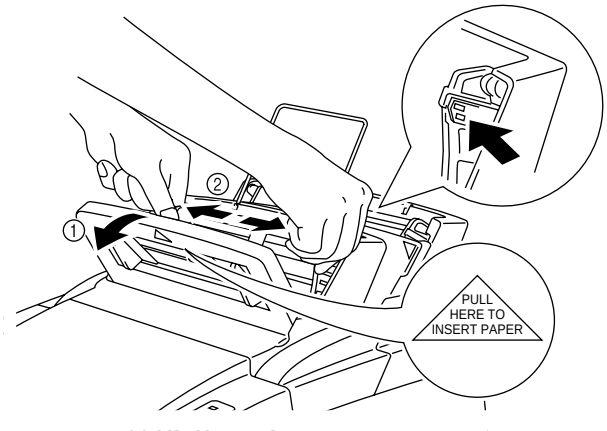


Fig.2-4 Opening the Feeder and Moving the Paper Guides

3. Load paper into the multi-purpose sheet feeder with the printing surface face down.

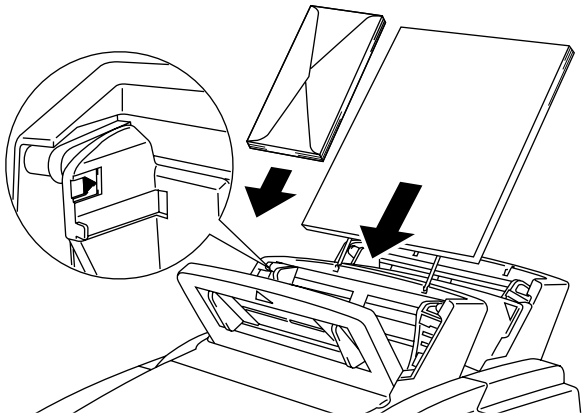


Fig. 2-5 Loading Paper or Envelopes in the Feeder

Note
If you load envelopes in Feeder 1, make sure they are inserted in the direction shown on the previous page.

Caution

- **If you print transparencies, load them sheet by sheet. Failure to do so may cause a double feed error.**
- The feeder can hold up to 200 sheets of plain paper (80 g/m^2, 20 lb.). If you load too many sheets, paper jams could occur.
- Make sure that the paper is stacked below the ▼ mark.
- If there is still some paper in the feeder, you must first remove it, put it together with the new paper and then insert the stack in the feeder.

4. Move the paper guide to the appropriate paper width (①) and close the multi-purpose sheet feeder. (②)

Caution

Failure to set the paper guides to the paper size may cause paper skew or jams.

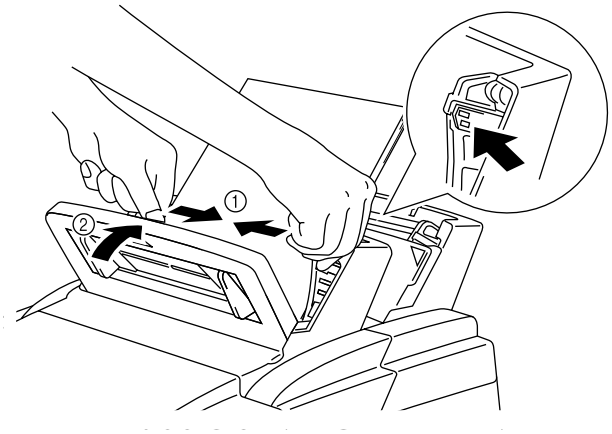


Fig. 2-6 Moving the Paper Guides and Closing the Feeder

Note

- If the multi-purpose sheet feeder runs out of paper when you try to print, the **Alarm** and **Paper** lamps blink to alert you. You have to load paper in the feeder and push the panel switch to cancel the alarm and continue printing. If paper jams in the printer, the **Alarm** and **Paper** lamps also blink. If the error is a paper jam, clear it referring to "PAPER JAMS" in Chapter 6.
- When the rear sheet feeder 2 runs out of paper and there is paper loaded in the front sheet feeder 1, be sure to remove paper from Feeder 1 temporarily (①) and load paper in Feeder 2. (②)

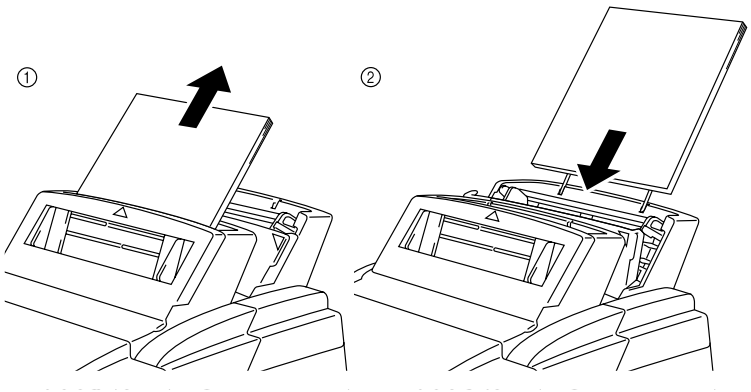


Fig. 2-7 Loading Paper in Feeder 2

Two Side Printing (Manual Duplexing)

The supplied printer driver for Windows 95/98 or Windows 3.1 allows for manual duplex printing from both Feeder 1 and Feeder 2. For more information about settings, see the help text in the printer driver.

The printer prints all the even numbered pages on one side of the paper first, and then prints all the odd pages on the reverse side of the paper.

When you have finished printing the even numbered sides of the paper, the driver instructs you to re-insert the paper by a pop-up message on your computer screen. Follow the instructions on how to reinsert the paper.

Note
- Before re-inserting the sheets, you have to straighten them, or you will get paper handling errors.
- The use of very thin or very thick paper is not recommended.
- If you encounter a double feeding error, we recommend that you hold all sheets of paper except the front sheet while the paper is feeding.

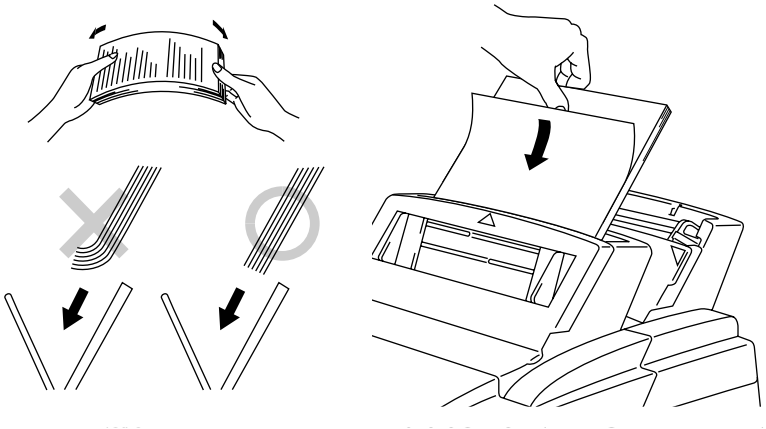


Fig. 2-8 Notes for Manual Duplexing

Note
When you use the Manual Duplex function, it is possible that paper jams may occur or print quality might not be satisfactory.

MANUAL FEED SLOT

The front multi-purpose sheet feeder 1 also has a manual feed slot. You can manually load paper **sheet by sheet** from this slot. You do not need to remove paper from the multi-purpose sheet feeder when using the manual feed slot.

❑ **When you load one sheet of paper manually:**
You do not need to choose manual feed in the Setup dialog box of your printer driver. While holding the selected size of paper in the proper orientation (Portrait or Landscape), place the side of the paper you wish to print on face down into the manual feed slot. Align the paper at the center of the manual feed slot, and be sure to insert it all the way. (①) Move the paper guide of the manual feed slot to the paper width you are using. (②)

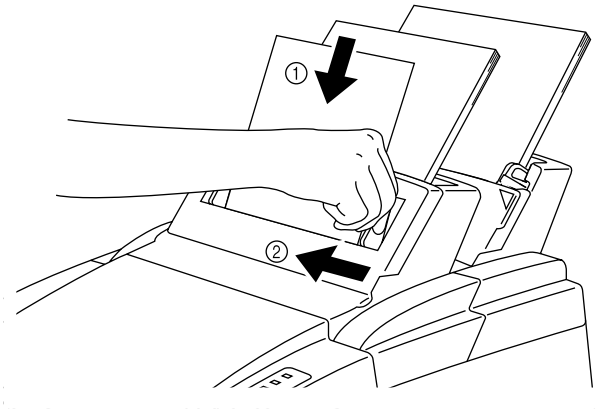


Fig. 2-9 Moving the Paper Guide

❑ **When you load more than one sheet of paper manually:**
Open the Setup dialog box of the supplied Windows printer driver and choose Manual Feed in the Paper Source section. Follow the above instructions to load the first page. The printer automatically starts printing. After the first page is printed, the dialog box appears and prompts you to load the next page. Load a sheet and choose OK to resume printing. Repeat these steps until you have finished printing all the pages.

Caution

If bi-directional communications are not operational between the printer and the computer, such as when the printer is shared on a network, the dialog box will not appear to load the next page. Manual paper feeding is not recommended when your printer is attached to a network.

Note

- Insert paper firmly into the manual feed slot.
- Be sure to load sheet by sheet when using the manual feed slot.

OUTPUT TRAY AND PAPER SUPPORT WIRE

The printer ejects paper with the printed surface face down into the output tray at the front of the printer.

When the output tray is closed, the ejected paper comes out sheet by sheet through the slit at the front. When you open the tray, sheets can be stacked on the tray.

Follow these steps to open the output tray:

1. Pull the top of the tray down (①).

2. Extend the extension support wire (②) and set the paper stopper (③).

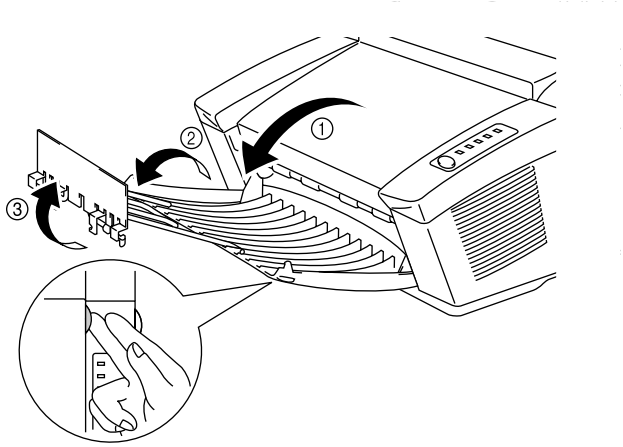


Fig. 2-10 Opening the Output Tray and Extending the Extension Support Wire

You can stack up to 100 sheets in the output tray.

Caution

- Use the paper stopper only when printing A4 or Letter size paper. Failure to set the paper stopper may cause ouput stack sheets to scatter.
- When you use transparencies, remove each sheet immediately after printing. Stacking sheets may cause the transparency to curl or jams
- Continuous printing with the output tray closed may cause condensation inside the output tray.

CHAPTER 3
CONTROL PANEL

LAMPS AND SWITCH

This section refers to the following lamps and switch on the printer control panel.

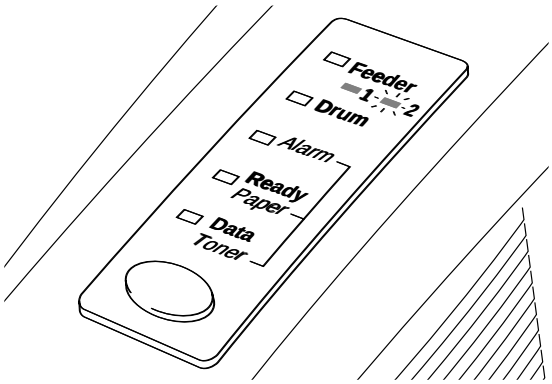


Fig. 3-1 Lamps and Switch on Control Panel

> **Note**
> When the **power** switch is off or the printer is in sleep mode, all lamps including the **Ready** lamp are off.

Ready (Paper) Lamp

The **Ready** lamp indicates the current status of the printer.

Lamp	Printer status
Off ❍	The power switch is off or the printer is in sleep mode. If the printer is in sleep mode, it will wake up automatically when it receives data or you press the control panel switch.
Blinking ❍↔●	The printer is warming up. (Blinking at 1 second intervals)
Blinking ❍↔●	The printer is cooling down and pauses printing until the printers internal temperature is lowered. (Blinking at 2 seconds intervals)
On ●	The printer is ready to print.

This lamp also works as the **Paper** lamp with the **Alarm** lamp. They blink simultaneously to indicate a paper error. See “Operator Calls” in Chapter 6.

Data (Toner) Lamp

The **Data** lamp indicates the current status of the print data process.

Lamp	Printer status
Off ❍	The printer has no print data.
Blinking ❍↔●	The printer is receiving data from the computer or the printer is processing data in memory.
On ●	Print data remains in the printer memory. If the **Data** lamp is on for a long period of time and nothing has printed, you need to press the switch to print the remaining data.

This lamp also works as the **Toner** lamp with the **Alarm** lamp. They blink simultaneously to indicate a toner error. See "REPLACING THE TONER CARTRIDGE" in Chapter 5 and "Operator Calls" in Chapter 6.

Drum Lamp

The **Drum** lamp indicates the drum unit is nearly at the end of its life.

Lamp	Printer status
Off ❍	The drum unit can be used.
On ●	The drum unit is nearly at the end of its life. Installing a new drum unit turns off this lamp. See "REPLACING THE DRUM UNIT" in Chapter 5.

Feeder Lamp

The **Feeder** lamp indicates that the rear sheet feeder 2 is selected through your software. When the front sheet feeder 1 is selected, the lamp is turned off.

Lamp	Printer status
Off ❍	Feeder 1 is selected.
On ●	Feeder 2 is selected.

Alarm Lamp

The **Alarm** lamp blinks to indicate a printer error status such as “Cover Open” and “Memory Full.” If any other error occurs, the printer indicates the error by blinking the **Alarm** lamp with another lamp or by printing an error report.

> **Note**
> The **Ready**, **Data** and **Drum** lamps are used to indicate printer errors with the Alarm lamp. See “ALARM INDICATIONS AT A GLANCE” in Chapter 6 and take corrective action for the error.

Switch

This **switch** will be used as the following purpose depending on the situation.

Cancel Printing
If you press the **switch** during printing, the printer immediately stops printing and ejects the paper.

Wake-up
If the printer is in sleep mode, pressing the **switch** wakes it up into the ready state.

Form Feed
If the **Data** lamp is on, press the **switch**. The printer prints any data remaining in the printer memory: this operation is called “Form Feed.”

Error Recover
If an error occurs, the printer will recover from some errors automatically. If the error does not clear automatically, press the **switch** to clear the error and continue printer operation.

Select Feeder
If the **Ready** lamp is on, press the **switch**. You can select Feeder 1 or Feeder 2.

Other Control Features

The printer has the following useful features:

Sleep Mode

When the printer does not receive data for a certain period of time (time-out), it enters sleep mode. Sleep mode acts as though the printer was turned off. The default time-out is 5 minutes. While the printer is in sleep mode, all the lamps are off and it is as if it was turned off, but the printer can still receive data from the computer. Receiving a print file or document automatically wakes up the printer to start printing. Pressing the **switch** also wakes up the printer.

> **Note**
> - When the printer goes into sleep mode, the fan will not stop until the printer engine has cooled down.
> - Sleep mode allows the print engine to cool, so the temperature of your room and how long the printer has been in sleep mode affects the warm-up time. This warm-up time can take up to 30 seconds. The **Ready** lamp blinks to indicate that the printer is warming up.
> - You can change the time out for the sleep mode with the supplied printer driver or Remote Printer Console program. Refer to the Help section in the printer driver or RPC program for more information about the sleep mode setting.

Test Print Mode

The printer has the following test print mode. Follow these steps:

1. Make sure that the top cover is closed.

2. Hold down the switch and turn on the power switch. Keep the **switch** depressed until the **Drum** lamp comes on.

   The **Drum** lamp lights to indicate that the printer is in the test print mode.

3. Press the **switch** again to execute the test print or hold down the **switch** to select another option and release the **switch** to execute the selected option.

   The test print mode varies depending upon the printer model as follows:

Lamp Lit	Choice	Function
Drum	Test sample page	The printer prints a test sample page. The printer returns to the ready status after printing.
Alarm	Print Config & Print Fonts I	The printer prints the current configuration of the printer and a list of the internal fonts. The printer returns to the ready status after printing.
Ready	Factory Reset	The printer is restored to the factory setting and permanent fonts and macros are cleared. The printer returns to the ready status after printing.
Data	Hex Dump Print	The printer can print data as hexadecimal values, so that you can check data errors and problems. To exit from this mode, you have to turn off the printer.

Control Features Set by the Brother Driver

Page Protection

If the printed images are too complex to print, the printer may print a partial image on the page. If this occurs, the printer has lost some print data and will indicate a “print overrun” error by printing an error report.

The page protection feature allows the printer to create the image to be printed in memory before physically moving the paper through the printer. Therefore, setting page protection to ON may eliminate the “PRINT OVERRUN” error.

The “AUTO” setting does not require additional memory and automatically uses page protection only when it is necessary. Occasionally, when AUTO page protection is on, processing complex print data may be slightly delayed.

Note
To set the Page Protection to A4, Letter or Legal paper sizes, the following total capacity of memory is required.

	300 dpi	600 dpi
Letter/A4	2 Mbytes	6 Mbytes
Legal	3 Mbytes	6 Mbytes

If your printer does not have enough memory for page protection, your document may be printed at 300 dpi.

You can set this function in the following ways.
- The supplied printer driver for Windows 95/98/3.1
- The supplied RPC program for DOS

For details of the settings, see the relevant help screen.

APT (Advanced Photoscale Technology)

APT allows your printer to produce fine gray scales to improve the appearance of documents containing photographic images.
Using this feature, the image is printed in 256 shades of gray at near photographic quality.

This setting can be made by using the supplied Windows driver. Also, a demo file which can be opened within Windows Write is included on the supplied disk. Try printing it with the APT feature.

For details of the settings, see the relevant help screen of the RPC or Windows driver.

Note
APT is a simpler feature than 1200 x 600 dpi for Windows DIB graphics. APT does not required so much memory as the 1200 x 600 dpi resolution setting.

CHAPTER 4
OPTIONS

SERIAL INTERFACE BOARD RS100M

To connect the printer to a DOS computer with a serial interface or to an Apple Macintosh computer, you need to install the optional serial interface board. When you have installed the serial interface board, you can share the printer between two computers (two IBM compatible PCs or one IBM compatible PC and one Apple Macintosh) using the parallel and serial interfaces at the same time. Automatic interface selection is a standard feature.

> **Note**
> - The serial interface board for this printer is optional, but in some countries the serial interface board may have been installed by either the factory or dealer.
> - The serial interface for Apple Macintosh (RS-422A) will only print at 300 dpi.

The serial interface board is installed onto the main controller board inside the printer. For the details about installation, see the instruction guide which was provided with the serial interface board.

Selecting the RS-422A (Apple) or RS-232C (IBM) Serial Interface

> **Note**
> This section is only for printer models which have had the serial interface installed.

> **Caution**
> Be sure to select the serial interface type to match your computer as follows:
> - For Apple Macintosh computers: you should not have to change any settings because the Apple (RS-422A) setting is factory selected (default).
> - For IBM compatible PCs you should move the switch to the IBM (RS-232C) setting.
> - If you are using an Apple Macintosh on the RS-422A port and an IBM compatible PC on the parallel port, it is not necessary to make any changes to the switch setting.

If necessary, select the interface type as follows:

1. Make sure that the printer is in the off-line state.

2. Select the RS-422A(Apple) or RS-232C(IBM) interface by changing the serial interface slide switch to the right for IBM(RS-232C) or to the left side for Apple(RS-422A).

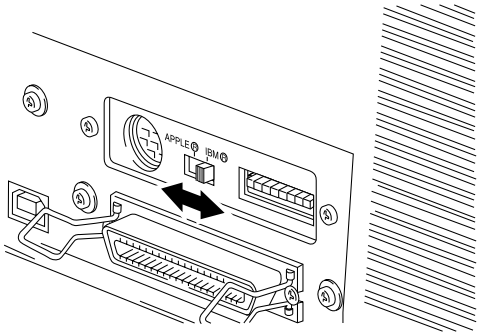


Fig. 4-1 Selecting the RS-422A (Apple) or RS-232C (IBM) Serial Interface

Setting the Serial Interface Parameters

> **Note**
> This section is only for printer models which have had the serial interface installed.

> **Caution**
> Be sure to set the parameters to match your computer as follows:
> - Never change the RS-422A parameters for Apple Macintosh computers. Because the RS-422A parameters have been correctly set at the factory for Apple Macintosh computers, you do not need to change the settings. You may skip this section. If you change parameters for the RS-232C serial interface and you switch back to RS-422A for Apple Macintosh computers, be sure to restore the parameters to the factory settings.
> - Set the RS-232C parameters to match your computer. You can set serial settings in several different places, within your DOS application, within the Windows Printer Icon (for Windows application software only), or within your `AUTOEXEC.BAT` file using MODE commands. For information on serial interface parameters, see the user's guide of your computer or software.

If necessary, set the serial interface parameters as follows:

1. Make sure that the printer is in the off-line state.

2. Set the serial interface parameters by moving up (on) or down (off) the selectors of the dual in-line package (DIP) switch.

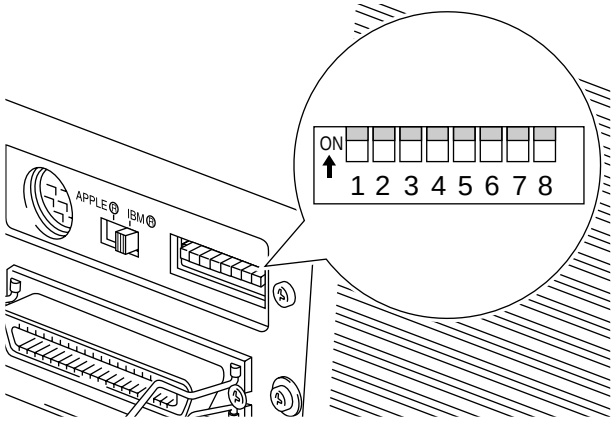


Fig. 4-2 Setting the Serial Interface Parameters

Table 1: Serial Interface Parameter Settings

Selector	Parameters	On (up)	Off (down)
1	Baud Rate	— See Table 2.	—
2	Baud Rate	— See Table 2.	—
3	Data Length	7 bits	**8 bits**
4	Stop Bit	2 bits	**1 bit**
5	Parity	— See Table 3.	—
6	Parity	— See Table 3.	—
7	Protocol	Xon/Xoff + DTR	**DTR only**
8	Robust Xon	On	**Off**

Table 2: Baud Rate Settings

Selector 1	Selector 2	For RS-422A	For RS-232C
Off	Off	**57600**	**9600**
On	Off	9600	4800
Off	On	1200	1200
On	On	19200	19200

Table 3: Parity Settings

Selector 5	Selector 6	Parity
On	On	Odd
On	Off	Even
Off	—	**None**

Note
- The factory settings are indicated in bold.
- If the robust Xon setting is turned on with selector 8, the printer sends Xon signals at one second intervals to the connected computer until it receives data. It is effective only if selector 7 is set to the On position for the Xon/Xoff plus DTR setting.

Connecting the Serial Interface Cable

Note
This section is only for printer models which have had the serial interface installed.

You need a serial interface cable with an 8-pin, DIN-type connector to connect your printer and computer.

Note
- Consult your dealer for a serial interface cable.
- If you are a Macintosh user, you can easily find the necessary cable at a local computer store. Look for Apple serial cables labeled as "Macintosh to ImageWriter II™ or "Macintosh to Personal LaserWriter™ 300" or the "Apple System Peripheral 8 Cable". **Do not purchase a serial cable labeled as "Straight-through" or "LocalTalk."**
- If you are a PC user, you need to purchase a special serial cable from your dealer. If you have a 9-pin connector on your computer, look for a cable labeled "IBM AT to ImageWriter II" cable. If you have a 25-pin connector, look for a cable labeled "DB25 to ImageWriter II." These cables most likely would be found in the Apple Macintosh section at your computer dealer. For more information about the interface specification, consult your dealer.

You can connect a parallel and a serial interface cable at the same time. The auto interface selection function allows you to share the printer with two computers. To do this, connect the parallel interface cable and then connect the serial interface cable as follows:

1. Make sure that the power switch is turned off.

> **Caution**
> Be sure to turn off the power switch before connecting or disconnecting the interface cables, or the printer may be damaged.

2. Insert and secure the parallel interface connector into the parallel interface port of your printer.

3. Insert and secure the serial interface connector into the serial interface port of your printer.

4. Turn on the power switch.

ADDITIONAL MEMORY

This printer has 4.0 MByte of standard memory and has one slot for optional additional memory. The memory can be expanded up to 36 MBytes by installing a commercially available single in-line memory module (SIMM).

Additional memory is useful and may be necessary if you are using the BR-Script 2 emulation, or the Page Protection function, full page graphics with APT or 1200 x 600 dpi resolution set to on. (For details about Page Protection, see Chapter 3 "Other Features".)

Minimum Memory Recommendation (including resident memory)

■ HP LaserJet 6P, EPSON FX-850, and IBM Proprinter XL

Page Protect = AUTO or Off

	300 dpi	600 dpi
Letter/A4	2 MB	2 MB
Legal	2 MB	2 MB

Page Protect = Letter, A4, or Legal

	300 dpi	600 dpi
Letter/A4	2 MB	6 MB
Legal	3 MB	6 MB

> **Note**
> This printer can also support DIB graphics with a resolution of 1200 x 600 dpi under Windows 95/98/3.1 with the supplied printer driver. We recommend to expand the printer memory to avoid any memory full errors that may occur at this high resolution.

■ BR-Script 2

	300 dpi	600 dpi
Letter/A4	2 MBytes	6 MBytes
Legal	3 MBytes	6 MBytes

The following type of SIMMs can be installed:

- 1 MByte HITACHI HB56D25632B-6A, -7A
- 2 MByte HITACHI HB56D51232B-6A, -7A
- 4 MByte HITACHI HB56A132BV-7A, 7AL, -7B, -7BL
- 8 MByte HITACHI HB56A232BT-7A, -7AL, -7B, -7BL
- 16 MByte TOSHIBA THM324000BSG-70
- 32 MByte TOSHIBA THM328020BSG-70

This printer can accept the following types of SIMMs;

Speed	60 nsec - 80 nsec
Pin Type	72 pin
Height	25.4 mm (1") or less
Output	32 bit or 36 bit

Note
The printer has only one slot for a SIMM upgrade.If you want to increase your printer memory again after you have installed a SIMM module into the slot, you will need to remove the previously installed SIMM first. For example if you have previously increased your memory from the standard 4 MB to 8 MB by adding a 4 MB SIMM and you wish to increase your total memory to 12 MB, you need to remove the installed 4 MB SIMM and install the new 8 MB SIMM into the printer.

Installing the SIMM

When you install the SIMM, follow these steps:

1. Turn off the power switch and unplug the power cord from the AC outlet. Then, disconnect the interface cable from the printer.

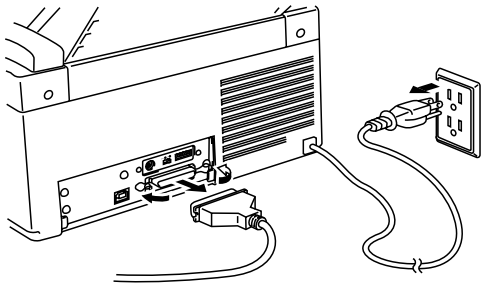


Fig. 4-3 Unplug the power cord and disconnect the interface cable

Note
Be sure to unplug the power cord to the printer before installing or removing the SIMM and the main controller board.

2. Unscrew the four screws securing the rear plate of the main controller board and pull out the main controller board.

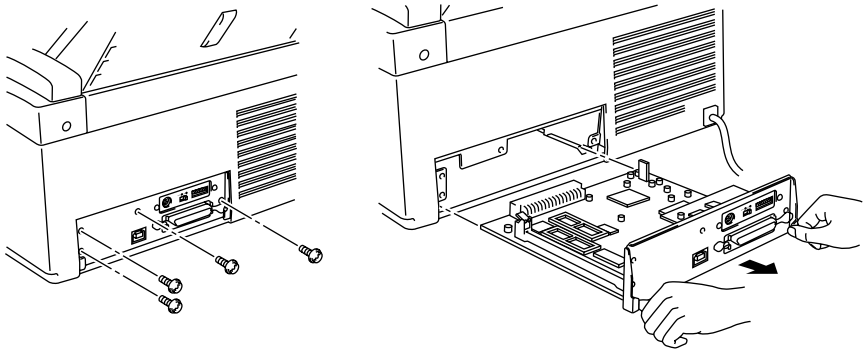


Fig. 4-4 Remove the main controller board

3. Unpack the SIMM and hold it on its edge.

> **Note**
> Do not touch the memory chips and the surface of the main controller board. If static electricity collects, it damages the memory.

4. Install the desired size of SIMM into the slot and push gently until it clicks into place.

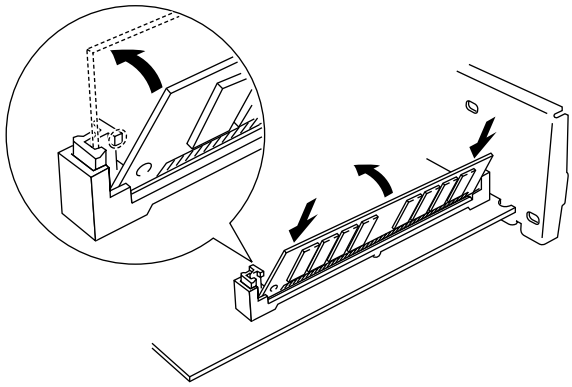


Fig. 4-5 Install the SIMM

5. Install the main controller board into the printer by sliding it into the guide rails.

6. Secure the main controller board with the four screws.

7. Reconnect the interface cable from your computer and plug the power cord into the AC outlet.

CHAPTER 5
MAINTENANCE

REPLACING THE TONER CARTRIDGE

The printer can print approximately 2,400 pages with one toner cartridge. When the toner cartridge is running low, the **Alarm** and **Data** (**Toner**) lamps blink once every 5 seconds to indicate toner low.

Note

- Actual page count will vary depending on your average document type. (i.e.: standard letter, detailed graphics, etc.)
- It is recommended that you always keep a new toner cartridge ready for use for when you get the toner low warning.
- Discard the used toner cartridge according to local regulations. If you are not sure of them, consult your local dealer. Be sure to seal the toner cartridge tightly so that toner powder does not spill out of the cartridge. Do not discard used toner cartridges with domestic rubbish.
- It is recommended that you clean the printer when you replace the toner cartridge. See "CLEANING THE PRINTER" in this chapter.

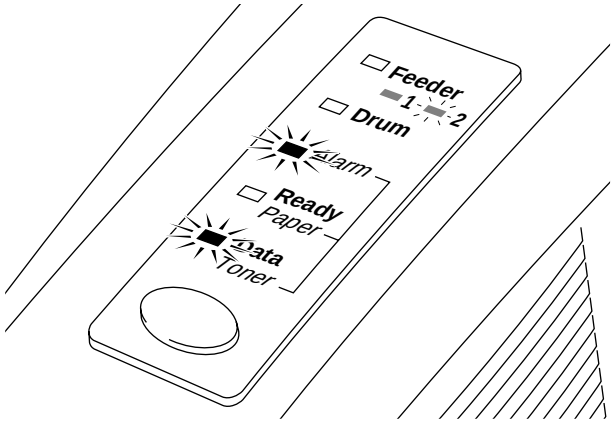


Fig. 5-1 Toner Low and Empty Indication

Caution

You may print approximately 100 pages after the first toner low indication. Both **Alarm** and **Data** (**Toner**) lamps will blink continuously to indicate that the toner is empty. Once this indication appears, your printer cannot resume printing until you have installed a new toner cartridge.

Caution

Keep the drum unit level after removing the toner cartridge, to avoid possible toner spill or scatter.

Follow these steps to replace the toner cartridge:

1. Turn off the power switch.

2. Open the top cover. Remove the drum unit by holding each side of the drum and gently lifting the drum towards you (up and out).

Note

Make sure that the top cover is correctly latched open, indicated by a click

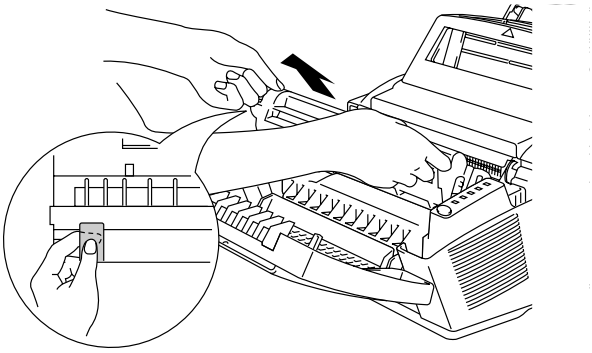


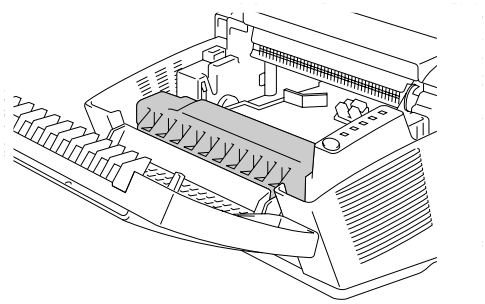
Fig. 5-2 Removing the Drum Unit

Note

It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

⚠ Warning

After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 5-3 Inside the Printer

3. Gently turn the lever on the toner cartridge forward until it stops.

Note

The toner cartridge cannot be removed unless the shutter is completely closed by turning the lever fully to the front.

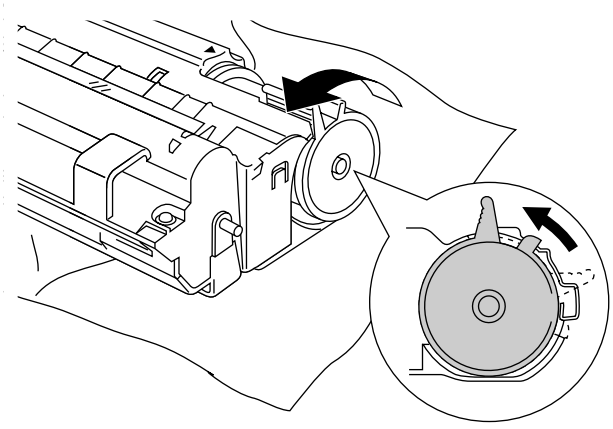


Fig. 5-4 Turning the Lever to Close the Shutter

4. Remove the old toner cartridge from the drum unit by pulling it out gently.

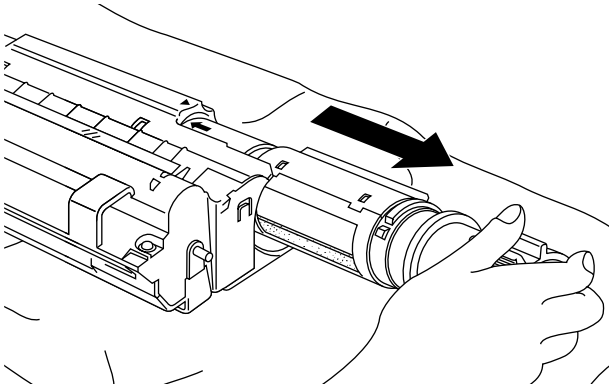


Fig. 5-5 Removing the Old Toner Cartridge

> **Caution**
> Handle the toner cartridge carefully. If toner scatters on your hands or clothes, wipe or wash it off with cold water immediately.

5. Unpack the new toner cartridge, gently shake it five or six times and then remove the protective part.

> **Caution**
> - Only unpack the toner cartridge immediately before installing it into the printer. If toner cartridges are left unpacked for a long period of time, the toner life is shortened.
> - Never turn the black ring of the toner cartridge.
> - **You can only use a Brother genuine toner cartridge which is specially formulated to ensure top print quality. Using another brand of toner cartridge could void your printer's warranty.**

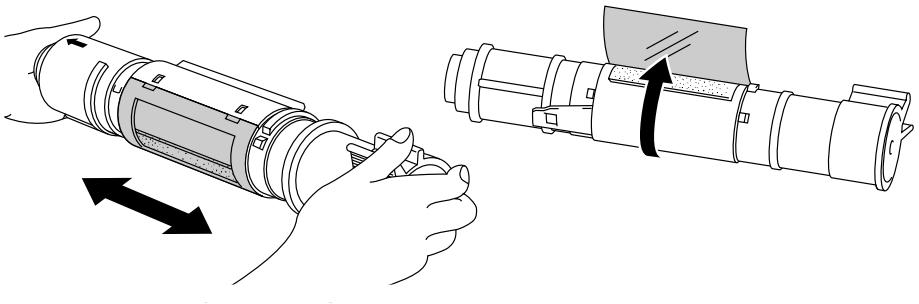


Fig. 5-6 Shaking the Toner Cartridge and Remove the Protective Part

6. Install the new toner cartridge into the right hand side of the drum unit. Make sure that the toner cartridge guide bar is exactly aligned with the guide slot in the drum unit to ensure that the toner cartridge and the drum unit fit together correctly.

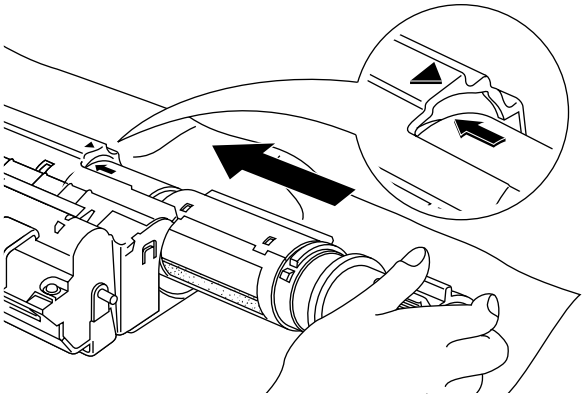


Fig. 5-7 Installing the Toner Cartridge into the Drum Unit

7. Gently turn the lever on the toner cartridge backward until it stops.

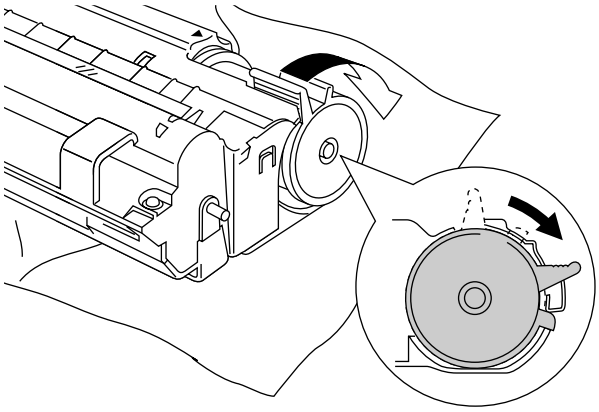


Fig. 5-8 Turning the Lever to Open the Shutter

8. Re-install the drum unit into the printer and close the top cover. Then, turn on the power switch.

REPLACING THE DRUM UNIT

The printer uses a drum unit to create the print images on paper. If the **Drum** lamp is on, it indicates the drum unit is nearly at the end of its life. We recommend you prepare a new drum unit to replace the current one. Even if the **Drum** lamp is on, you may be able to continue to print without replacing the drum unit for a while. If there is a noticeable deterioration in the output print quality even before the **Drum** lamp lights, then the drum unit should be replaced.

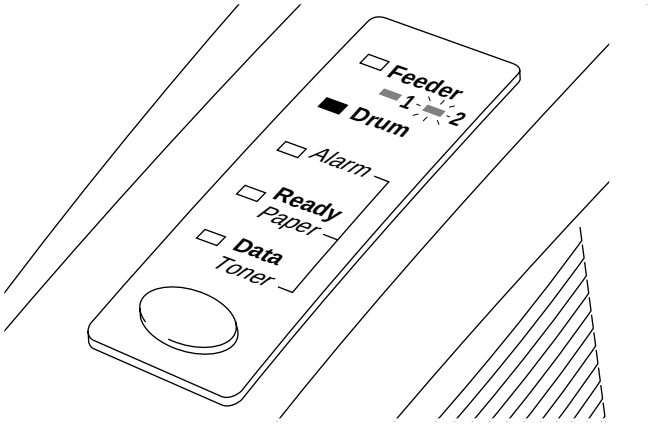


Fig. 5-9 Drum Unit Nearly at the End of its Life

Caution

- When removing the drum unit, handle it carefully as it may contain toner.
- You should clean the printer when you replace the drum unit. See "CLEANING THE PRINTER" in this chapter.

Note

The drum unit is a consumable, and it is necessary to replace it periodically.
There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc.. The drum life is estimated at approximately 20,000 pages at 20 pages per job and 8,000 pages at 1 page per job. The actual number of pages that your drum will print may be significantly less than these estimates. Because we have no control over the many factors that determine the actual drum life, we cannot guarantee a minimum number of pages that will be printed by your drum.

For best performance, use only genuine Brother toner, and the product should only be used in a clean, dust-free environment with adequate ventilation.

Follow these steps to replace the drum unit:

1. Turn off the power switch.
2. Open the top cover and remove the old drum unit.

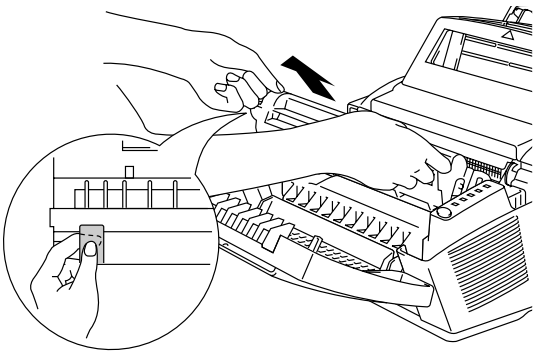
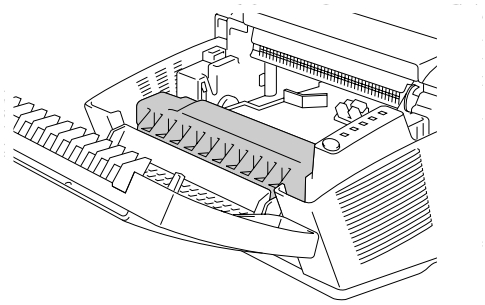


Fig. 5-10 Removing the Drum Unit

⚠ Warning

After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 5-11 Inside the Printer

3. Remove the toner cartridge from the drum unit and keep it in a safe place. For more information, see "REPLACING THE TONER CARTRIDGE" in this chapter.

Note

- Discard the used drum unit according to local regulations. If you are not sure of them, consult your local dealer/retailer. Be sure to seal the drum unit tightly so that toner powder does not spill out of the unit. Do not discard used drum units with domestic rubbish.
- It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

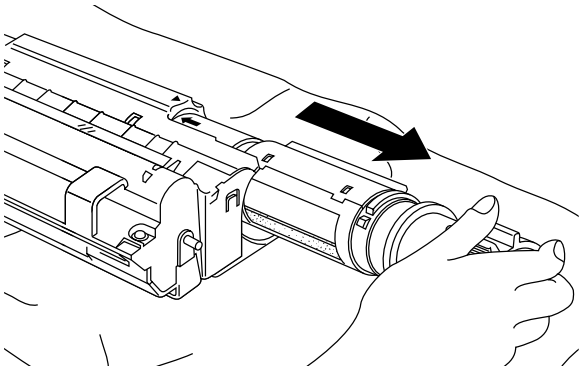


Fig. 5-12 Removing the Toner Cartridge

4. Unpack the drum unit and gently shake it five or six times horizontally.

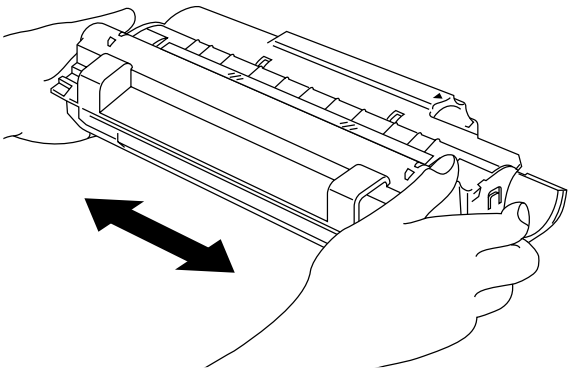


Fig. 5-13 Shaking the Drum Unit

Caution

- **Do not remove the starter sheet.**

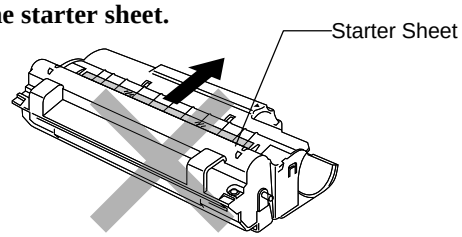


Fig. 5-14 Do Not Remove the Starter Sheet

- Only unpack a drum unit immediately before installing it into the printer. If an unpacked drum unit is subjected to excessive direct sunlight or room light, the unit may be damaged.
- Handle the toner cartridge and the drum unit carefully as it contains toner. If toner scatters and your hands or clothes get dirty, wipe or wash it off with cold water immediately.

5. Install the toner cartridge into the new drum unit. For more information, see “REPLACING THE TONER CARTRIDGE” in this chapter.

6. Install the new drum unit into the printer.

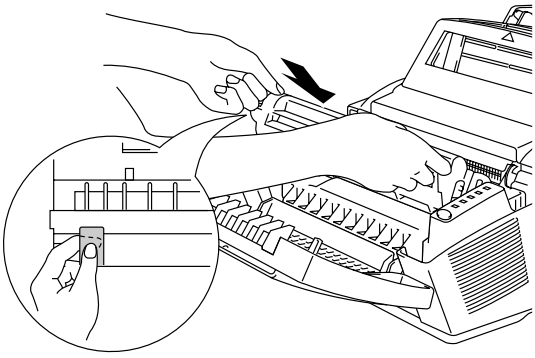


Fig. 5-15 Installing the Drum Unit

7. Close the top cover.

8. Turn on the power switch. The printer automatically ejects the starter sheet. Ejecting this sheet resets the drum life alarm.

> **Caution**
> Do not open the top cover until the printer ejects the starter sheet completely. It may cause the starter sheet to jam.

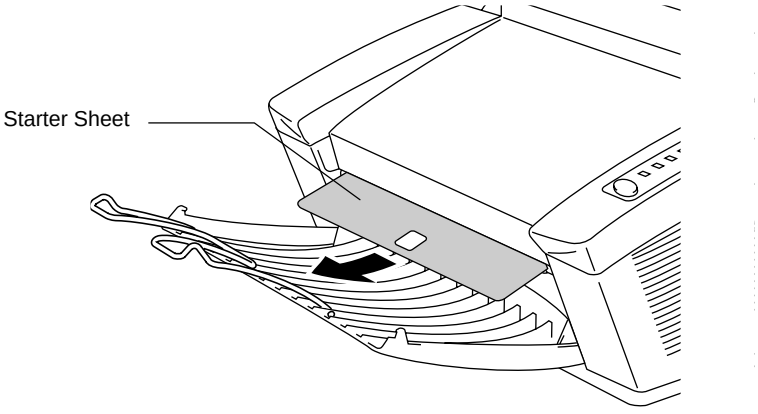


Fig. 5-16 Ejecting the Starter Sheet

ADJUSTING THE PRINT DENSITY

The print density dial is located inside the printer. You can use it to adjust the amount of toner applied to the paper.

When the toner cartridge and drum unit are replaced, or if the operating temperature and humidity are high or low, print conditions may change causing darker or lighter printouts.

Use a screwdriver to turn the print density dial gently clockwise for darker printouts and counterclockwise for lighter printouts. The dial has been factory set to the middle position.

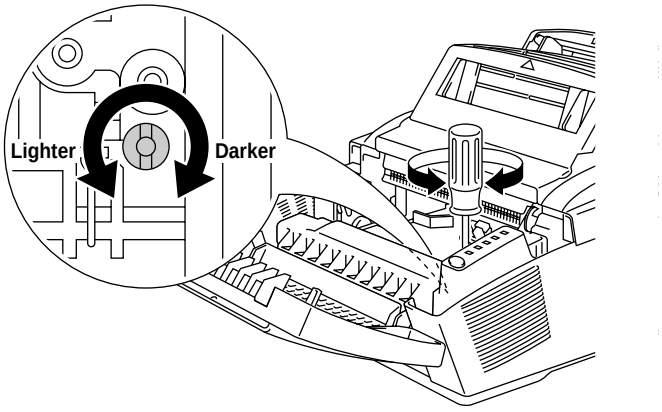
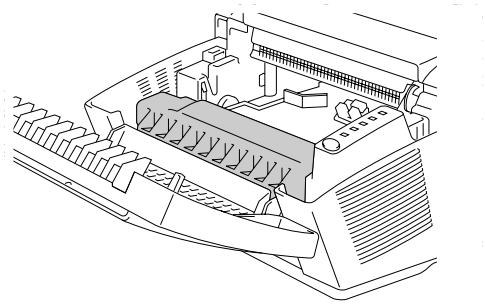


Fig. 5-17 Adjusting the Print Density Dial

⚠ Warning

After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 5-18 Inside the Printer

CLEANING THE PRINTER

Clean the printer exterior and interior periodically. If printed pages get stained with toner, clean the printer interior and drum unit.

Cleaning the Printer Exterior

Clean the printer exterior as follows:

1. Turn off the power switch and unplug the power cord.

⚠ Warning

There are high voltage electrodes inside the printer. Before cleaning the printer, make sure to turn off the power switch and unplug the power cord from the power outlet

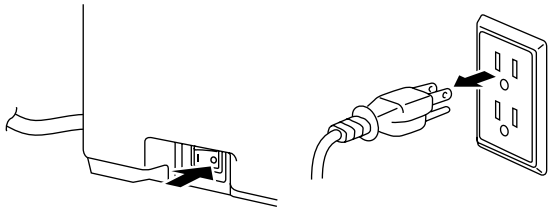


Fig. 5-19 Turning off the Switch and Unplugging

2. Remove the paper in the multi-purpose sheet feeders.

3. Use a damp cloth for cleaning.

❗ Caution

Use water or neutral detergents for cleaning. Cleaning with volatile liquids such as thinners or benzene will damage the surface of the printer.

4. Wipe dirt and dust away from the printer exterior and feeders with a cloth.

5. Load paper into the multi-purpose sheet feeders, and plug in the power cord.

Cleaning the Printer Interior and Drum Unit

Clean the printer interior and the drum unit as follows:

1. Turn off the power switch and unplug the power cord.

⚠ Warning

There are high voltage electrodes inside the printer. Before cleaning the printer, make sure to turn off the power switch and unplug the power cord from the outlet.

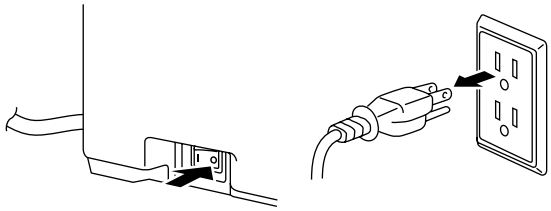


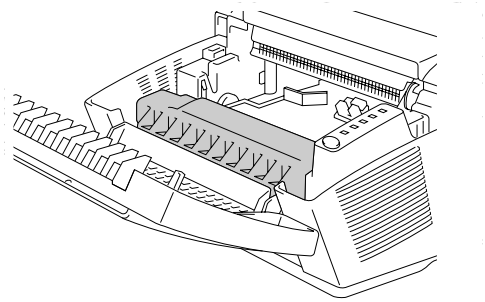
Fig. 5-20 Turning off the Switch and Unplugging

2. Open the top cover of the printer.

3. Take the drum unit out of the printer and put it aside on a piece of disposable paper.

⚠ Warning

After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following illustration.



⚠ High Temperature

Fig. 5-21 Inside the Printer

4. Gently wipe the scanner window with a soft dry cloth.

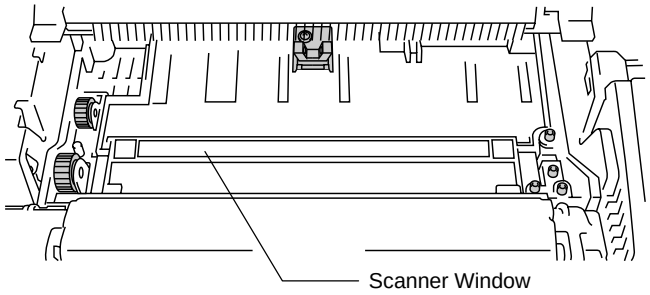


Fig. 5-22 Cleaning the Scanner Window

Caution

- Do not touch the scanner window with your finger.
- Do not wipe the scanner window with cleaning alcohol (isopropyl).

5. Turn the drum unit upside down carefully.

Caution

Handle the drum unit carefully as it contains toner. If toner scatters and your hands or cloths get dirty, wipe or wash it off with cold water immediately.

Note

It is recommended to put the drum unit on a piece of disposable paper or cloth in case of accidental toner spill or scatter.

6. Clean the primary corona wire inside the drum unit by gently sliding the tab to the right and left several times.

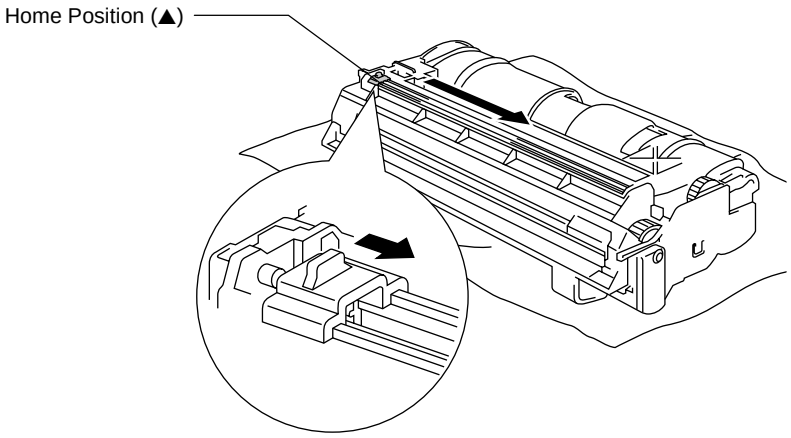


Fig. 5-23 Cleaning the Primary Corona Wire

7. Return the tab to the home position (▲ mark position) before reinstalling drum unit.

> **Caution**
> Be sure to position the tab at the home position, or printed pages may have vertical stripes.

8. Install the drum unit into the printer.
   See the section "REPLACING THE DRUM UNIT" in Chapter 5.

9. Close the top cover.

10. Plug in the power cord and turn on the power switch.

Cleaning the Paper Feed Rollers

Clean the paper feed rollers inside the multi-purpose sheet feeders with a clean cloth as shown below:.

1. Cleaning the Feeder 1 paper feed rollers.

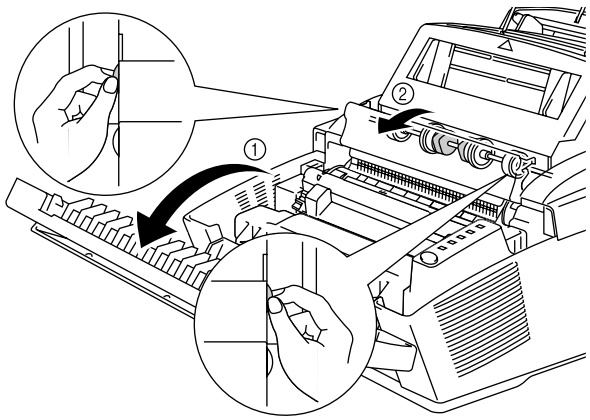


Fig. 5-24 Cleaning the Feeder 1 Paper Feed Rollers

2. Cleaning the Feeder 2 paper feed rollers.

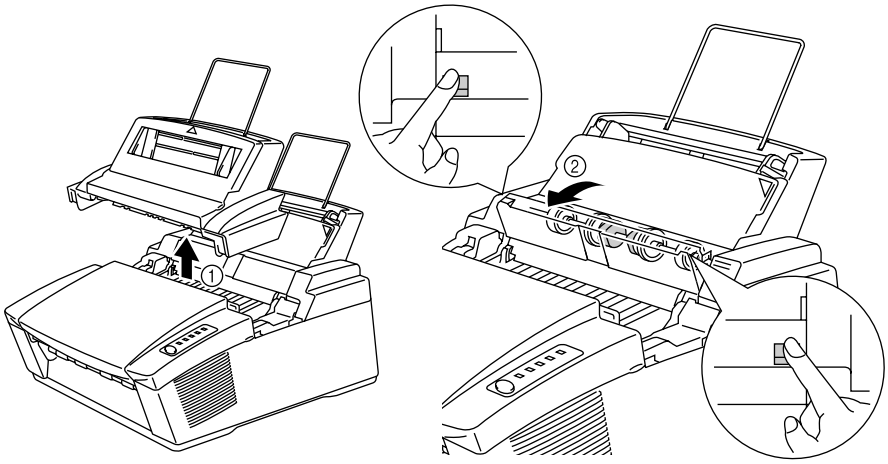


Fig. 5-25 Cleaning the Feeder 2 Paper Feed Rollers

RE-PACKING THE PRINTER

Caution

Whenever you transport the printer, use the packing materials which are provided with your printer. Also, follow the steps below to re-pack the printer, or the printer may be damaged which will void the printer's warranty.

1. Turn off the power switch and unplug the printer from the AC outlet.
2. Open the top cover.
3. Remove the drum unit assembly, referring to the previous section.

Note

Remove the drum unit assembly with the toner cartridge included.

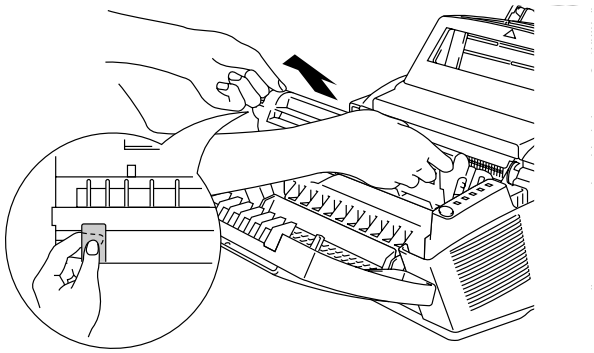


Fig. 5-26 Removing the Drum Unit Assembly

4. Place the drum unit assembly in the plastic bag and seal the bag completely.

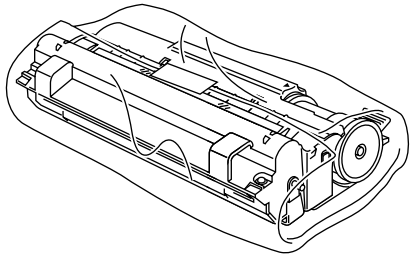


Fig. 5-27 Placing the Drum Unit in the Plastic Bag

5. Close the top cover, the extension wire, and the output tray.

6. Wrap the printer in the plastic bag and place it in the original carton box with the original Styrofoam packing material.

7. Place any documents (manual and any documentation describing the reason for repacking printer), and drum unit assembly in the carton box as shown below.

8. Close the carton box and tape it.

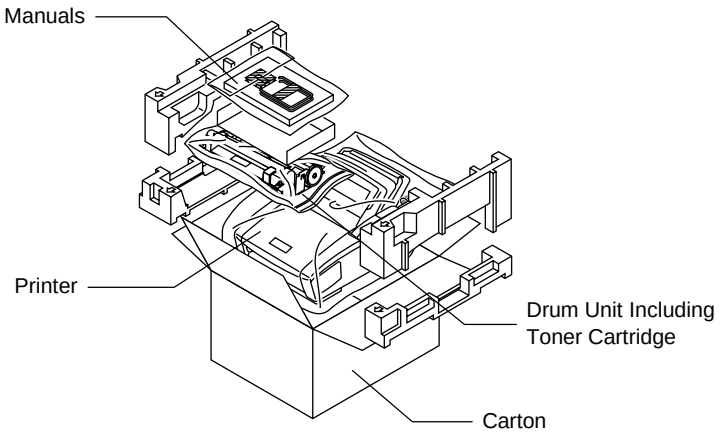


Fig. 5-28 Repacking the Printer

CHAPTER 6
TROUBLESHOOTING

ALARM INDICATIONS AT A GLANCE

Operator Calls

If a recoverable error occurs, the printer indicates an 'operator call' by blinking the **Alarm** lamp and any of the following lamps.

Find the error and take the proper action to correct it. The printer automatically recovers from most errors, but you may need to reset the printer with the panel **switch** as described below.

Blinking Lamp	Error	Action
Paper ❍↔● **Alarm**❍↔●	Paper jam	Clear the paper jam referring to the next section "PAPER JAMS" and press the panel **switch** if the printer does not automatically resume printing.
	Paper empty	Load paper in the printer referring to Chapter 2 and press the panel **switch**.
	Misfeed	Reinstall the paper and press the panel **switch**.
Toner ❍↔● **Alarm**❍↔● (every 5 seconds)	Toner low	Indicates that the printer has approximately 100 pages of printing left before the toner cartridge is empty. Prepare a new toner cartridge.
Toner ❍↔● **Alarm**❍↔● (Fast blinking)	Toner Empty	Replace the toner cartridge with a new one referring to Chapter 5.

For errors shown below, the printer indicates an operator call by blinking the **Alarm** lamp. If you use the printer with the supplied Windows driver, the status monitor will appear to indicate the error on your computer screen. The printer also prints some error messages on paper.

Error	Action
Cover Open	Close the top cover of the printer.
Print Overrun	• Press the panel **switch** to print the data remaining in the printer. • If you are using the supplied Windows driver, try again after changing the following settings. The best combination of the settings below will vary depending on your document. Graphics Mode TrueType Mode Use Printer True Type Fonts Page Protection • If this does not clear the error, reduce the complexity of your document or reduce the print resolution. • Expand the printer memory by installing a SIMM and set page protection to ON by using the supplied Windows driver or RPC program.
Memory Full	• Press the panel **switch** to print the data remaining in the printer. • If you are using the supplied Windows driver, try again after changing the following settings. The best combination of the settings below will vary depending on your document. Graphics Mode TrueType Mode Use Printer True Type Fonts Page Protection • Expand the printer memory by adding a commercially available SIMM. • Reduce the print resolution or reduce the complexity of your document.
Parallel Interface Line Error	• Press the panel **switch** to resume printing. • Check that the connection between your computer and printer is secure and correct, and check the interface cable.
Serial Interface Framing Error	• Press the panel **switch** to resume printing. • Check the communication parameters such as baud rate and stop bit on both your computer and printer.
Serial Interface Parity Error	• Press the panel **switch** to resume printing. • Check the communication parameters such as bit length and parity on both your computer and printer.
Serial Interface Overrun Error	• Press the panel **switch** to resume printing. • The interface hardware may be damaged. Consult your dealer.

Error	Action
Serial Interface Input Buffer Overflow	• Press the panel **switch** to resume printing. • Check the communication parameters such as the handshake protocols on both your computer and printer. • If the error occurs again, the interface hardware may be damaged. Consult your dealer.

Note
If the printer does not operate as you expect it to, it is recommended that you turn off the power switch, wait a few seconds and then turn it on again. If you still have problems, consult your dealer or our authorized service representative.

Service Calls

If an unrecoverable error occurs, the printer indicates the need for a service call by lighting **all the lamps** and then the following combination of lamps alternately:

Service Call	Fuser mal-function	Laser BD malfunction	Scanner malfunction	ROM error
Feeder	❍	❍	❍	❍
Drum	●	❍	●	❍
Alarm	❍	●	●	❍
Ready	❍	❍	❍	●
Data	❍	❍	❍	❍

Service Call	D-RAM error	Service A	Service B	CPU Runtime error
Feeder	❍	❍	❍	❍
Drum	●	❍	●	●
Alarm	❍	●	●	●
Ready	●	●	●	●
Data	❍	❍	❍	●

Service Call	NV-RAM error
Feeder	❍
Drum	●
Alarm	❍
Ready	●
Data	●

● ON ❍ OFF

If you see any of these service call indications, turn off the power switch, wait a few seconds and then turn it on and try to print again.

If you cannot clear the error and see the same service call indication after turning on the printer, consult your dealer or our authorized service representative. Report the error status and situation referring to the above table.

> **Note**
> Ensure that the top cover is properly closed and the main controller board is correctly installed.

PAPER JAMS

Before you can clear a paper jam error, you need to find the location of the paper jam. Locate the position referring to the following figure.

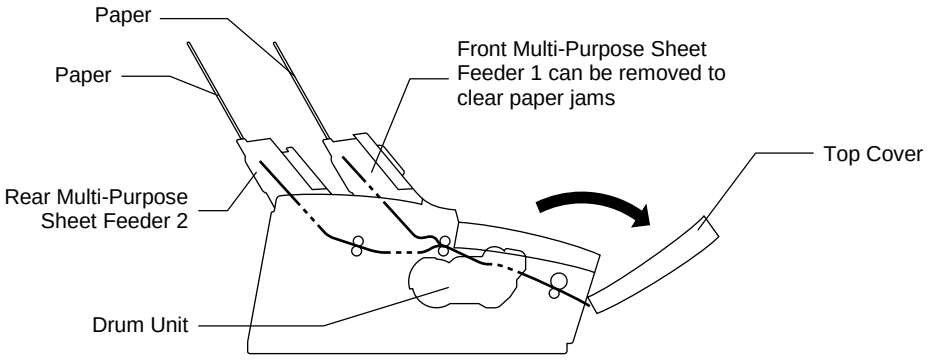
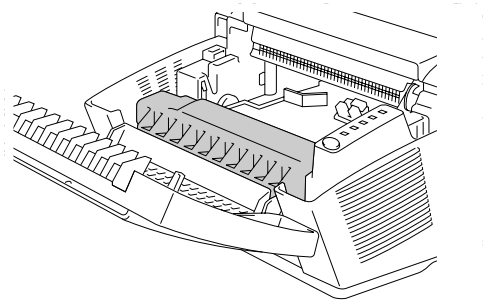


Fig. 6-1 Locating Paper Jam Position

After locating the position, clear the jammed paper referring to the following descriptions. If the jammed paper is removed completely and the top cover is closed, the printer may resume printing automatically. If the printer does not resume printing, press the control panel **switch**.

⚠ Warning

After you have just used the printer, some internal parts of the printer are extremely hot. When you open the top cover of the printer, never touch the shaded parts shown in the following diagram.



⚠ High Temperature

Fig. 6-2 Inside the Printer

❑ Paper Jam in the Multi-Purpose Sheet Feeder

If a paper jam has occurred inside the multi-purpose sheet feeder 1 or 2, pull the jammed paper upwards out of the feeder. Also, remove Feeder 1 and open the top cover to check that a torn piece of paper does not remain inside the printer: refer to the following sections.

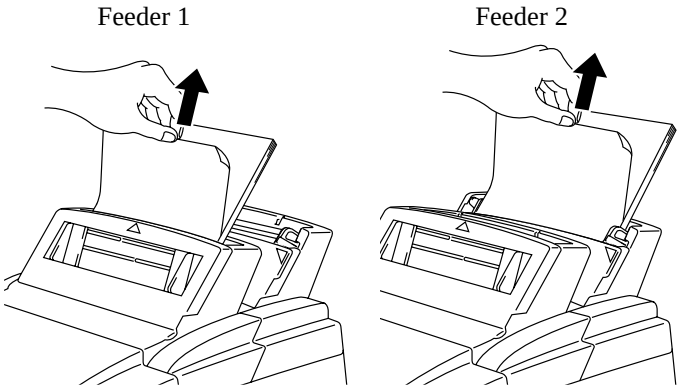


Fig. 6-3 Paper Jam in the Feeders

If the paper cannot be pulled up, see the next sections "Paper Jam under Feeder 1" and "Paper Jam near the Drum Unit."

❑ Paper Jam under Feeder 1

If a paper jam has occurred under the front multi-purpose sheet feeder 1, remove the feeder. (①) Then, pull the jammed paper upwards and out of the printer. (②) Re-install the feeder.

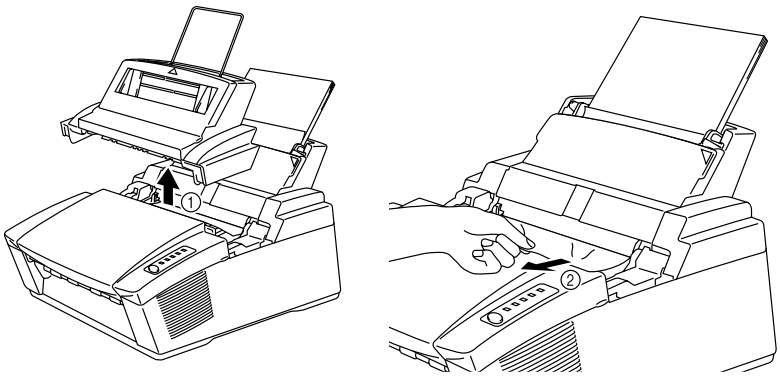


Fig. 6-4 Paper Jam under Feeder 1

❑ Paper Jam near the Drum Unit

If a paper jam has occurred near the drum unit, open the top cover and remove the drum unit. (①) Then, pull the jammed paper upwards slowly and out of the printer. (②) Install the drum unit and close the top cover.

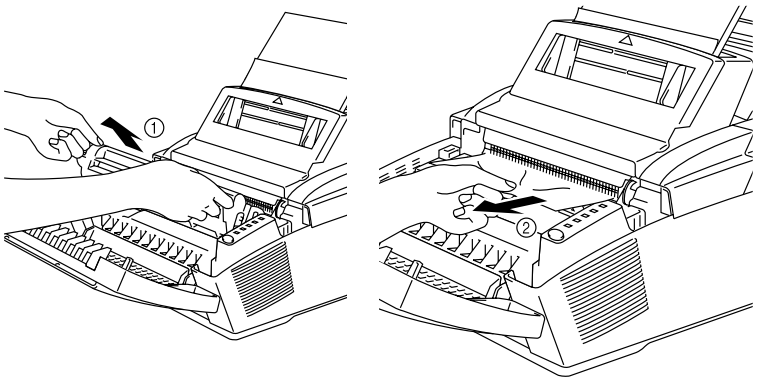


Fig. 6-5 Paper Jam near the Drum Unit

❑ Paper Jam in the Fuser Unit or at the Paper Output Tray

If a paper jam has occurred in the fuser unit or at the paper output tray, open the top cover and remove the drum unit. (①) Then, pull the jammed paper slowly out of the fuser. (②) Install the drum unit and close the top cover.

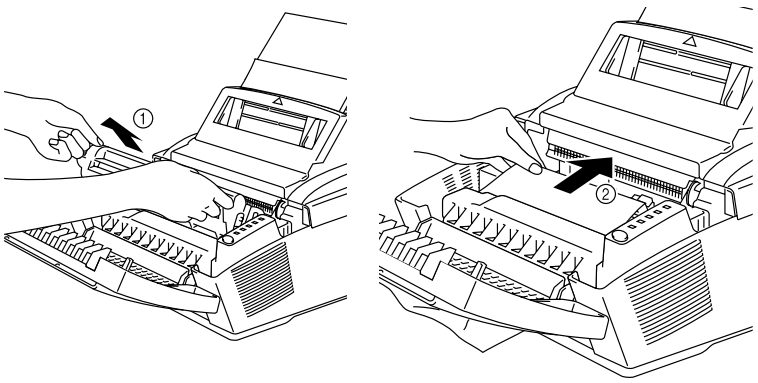


Fig. 6-6 Paper Jam Inside the Printer

Caution

Do not pull jammed paper from the output tray. Be sure to open the top cover to remove the jam, or the fuser may get dirty with toner powder and may result in toner scatter on the next printed page or pages.

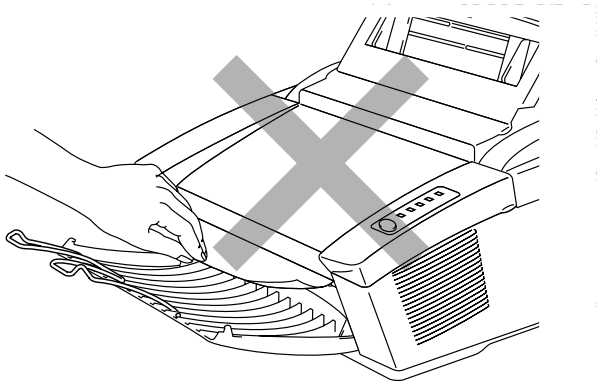


Fig. 6-7 Do Not Pull the Jammed Paper from the Output Tray

Q & A

This section contains questions and answers for using your printer. If you have encountered a problem, find the question relating to your problem and take the steps recommended to correct the problem.

Setting Up the Printer Hardware

Question	Recommendation
The printer does not work. All lamps are off.	The printer may be in sleep mode. Press the panel **switch** to wake up the printer. Check to see if the printer is plugged into a live power source and the power switch is on.
The printer does not print.	Check the following: • The printer is turned on. • All of the protective parts have been removed. • The toner cartridge and drum unit are installed properly. • The interface cable is securely connected between the printer and computer. • Check to see if the **Alarm** lamp is blinking. If the lamp is blinking, refer to the Operator Call section of this manual. • Check to see if the **Ready** lamp is blinking. If the lamp is blinking fast, the printer might be cooling down to lower the printers internal temperature. Open the top cover of the printer to lower the temperature.

Setting Up the Printer for Windows

Question	Recommendation
I cannot print from my application software.	• Make sure the supplied Windows printer driver is installed and selected with your application software. • If you use the serial interface, make sure that the serial slide switch of the serial interface is in the correct position and the interface settings are correctly set up with the DIP switches.
Sometimes I get a Print Overrun error when printing certain documents from Windows.	• Change the following settings in the driver and try again. Page Protection Graphics Mode TrueType Mode Use Printer TrueType Fonts • Reduce the print resolution or reduce the complexity of your document and try again. • Expand the printer memory by installing SIMM and turn page protection A4, Letter or Legal to ON through the supplied Windows driver or RPC.
Sometimes I get the Memory Full message. How can I correct this?	• Change the following settings in the driver and try again. Page Protection Graphics Mode TrueType Mode Use Printer TrueType Fonts • Another solution is to purchase more memory. • Reduce the print resolution or reduce the complexity of your document and try again.

Setting Up the Printer for DOS

Question	Recommendation
I cannot print from my application software.	• Check if the DOS application software interface settings match that of your printer: for example, if you are using a parallel printer cable, you would most likely set your DOS software printer port to LPT1. • Check to see if the printer has any printer alarms active. • If the serial interface is used, make sure that the RS-232C serial interface is selected with the slide switch. Make sure that the interface settings are correctly set up with the proper DIP switches. Make sure the serial parameters of baud rates, parity and stop bits match between your application software and the printer.
The printer prints, but it prints incorrect information. Sometimes it prints a couple of characters and then ejects the page, etc.	This is an indication that your application printer emulation setting and the printer's emulation do not match. Check in your application software which printer you have selected to make sure the printer is set up correctly. Remember this printer emulates three widely used printer selections: HP LaserJet 6P, Brother BR-Script Level 2, Epson FX-850, and IBM Proprinter XL. Try setting the printer into HP emulation and then select the HP LaserJet 6P printer in your application software.
The printer does not print when I press the Print Screen Key. (Data lamp On)	Press the panel **switch**. The data has been sent to the printer but the printer did not receive the Page Eject command: print screens do not send this command.
The printer prints the first part of my document but does not print the last page. (Data lamp On)	This was a common problem with database software and spreadsheet software when not correctly set up. The data has been sent to the printer but the printer did not receive the Page Eject command. Press the panel **switch** to eject the page. Then check with your software supplier on how to add a Page Eject (or Form Feed) command to the end of your print job.
How can I change the User settings or default settings of the printer?	Use the remote printer console (RPC) program.

Setting Up the Printer for Apple Macintosh Computers

When Using the Optional RS-100M Serial Interface

Question	Recommendation
I cannot print from my application software.	• Make sure that the supplied Macintosh printer driver is installed in the System Folder and it is selected with Chooser. • Check the PORT selection within the Chooser: it should match the port to which you physically attached the printer cable. • The serial slide switch of the optional interface board should be in the Apple (RS-422A) position. • Check the printer cable type: you cannot use a LocalTalk or straight-through cable. Refer to Chapter 4 for details on printer cable type.

Paper Handling

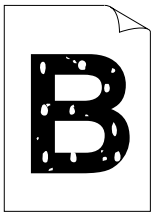
Question	Recommendation
The printer does not load paper.	• Check to see if the "Paper Empty" message appears on your computer screen or the **Alarm** and **Paper** lamps are blinking on the printer control panel. If so, the multi-purpose sheet feeder may be out of paper or not properly installed. If it is empty, load a new stack of paper into the feeder. • If there is paper in the multi-purpose sheet feeder, make sure it is straight. If the paper is curled, you should straighten it before printing. Sometimes it is helpful to remove the paper, turn the stack over and put it back into the paper tray. • Reduce the amount of paper in the multi-purpose sheet feeder, then try again. • Clean the paper feed rollers. See "Cleaning the Paper Feed Rollers" in Chapter 5.
The printer does not load paper from the manual feed slot.	Re-insert the paper firmly, one sheet at a time.
How can I load envelopes?	You can load envelopes from either the multi-purpose sheet feeder 1 or the manual feed slot. Your application software must be set up correctly to print on the envelope size you are using. This is usually done in the page setup or document setup menu of your software. Refer to your application manual.
What paper can I use?	You can use plain paper, envelopes, transparencies, labels, and organizer paper. For information on loading paper, see "Paper Handling" in Chapter 2.
How can I clear paper jams?	See "PAPER JAMS" in this chapter.

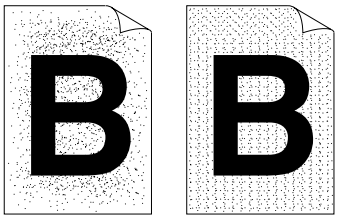
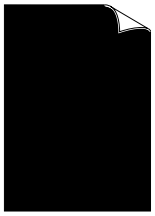
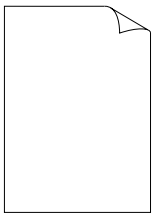
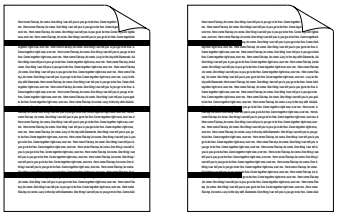
Printing

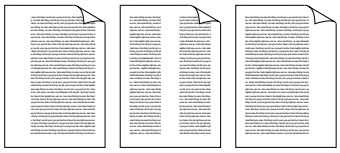
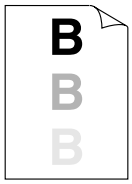
Question	Recommendation
The printer prints unexpectedly or it prints garbage.	• Turn on and off the printer or reset the printer. • Make sure your application software is correctly set up to use this printer by checking the printer settings in your application software. • Check the printer emulation settings. If you can use the supplied RPC program, use it to change the settings as required. Also, you can print the current setting list from the RPC program or Printer Control Panel. • Make sure that the correct interface type and settings are set up to match your computer. Be sure to use the RS-422A serial interface for Macintosh computers and the RS-232C serial interface for PCs. Refer to "SERIAL INTERFACE BOARD RS100M" in Chapter 4.
The printer cannot print full pages of a document. An error message "Print Overrun" occurs.	The printer received a very complex print job and could not process part of the page. This may be solved by the following ways. • If you are using Windows 3.1/95/98 with the supplied printer driver, change the following settings in the driver and try again. Graphics Mode TrueType Mode Use Printer TrueType Font • Set the page protection mode to "AUTO" or your document size. • Reduce the print resolution or reduce the complexity of your document and try again.
The printer prints the first couple of pages correctly, then some pages have text missing.	This is a problem usually relating to serial interface settings. Your computer is not recognizing the printer's input buffer full signal. Causes could be incorrect serial cable (incorrectly wired or too long) or incorrect setting of your computer serial interface.
The printer cannot print full pages of a document. A "Memory Full" error message occurs.	Some applications download several types and sizes of fonts. This can use up your printer memory very quickly. Set the Page Protection to AUTO, reduce the number of font sizes within your application, reduce the resolution, or purchase additional SIMM for the printer.
My headers or footers appear when I view my document on screen but do not show up when I print them.	Most laser printers have a restricted area that cannot be printed on. Usually the first two lines and last two lines of text cannot print (leaving 62 printable lines). Adjust the top and bottom margins in your document to allow for this.

Print Quality

> **Caution**
> You may clear a print quality problem by replacing the drum unit with a new one **if the Drum lamp is on**. The drum unit is at the end of its life.

Question	Recommendation
Printouts are too dark or light.	Turn the print density dial counterclockwise for lighter images and clockwise for darker images. It has been factory set to the middle position. See "ADJUSTING THE PRINT DENSITY" in Chapter 5.
Printed pages contain white stripes. **Fig. 6-8 White Stripes or Faint Images**	You may clear the problem by wiping the scanner windows with a soft cloth. (See "Cleaning the printer interior and Drum unit." in Chapter 5.) If you still have the same problem and the **Drum** lamp is on after cleaning, replace the drum unit with a new one.
Printed pages are stained with toner or have vertical stripes. **Fig. 6-9 Dark Stripes or Toner Stains**	• Clean the printer interior and the primary corona wire of the toner cartridge. See "Cleaning the Printer Interior and Drum Unit" in Chapter 5. • Make sure that the tab of the corona wire is at the home position. If you still have the same problem and the **Drum** lamp is on after cleaning, replace the drum unit with a new one.
Printed pages have white spots in black text and graphics area.  **Fig. 6-10 White Spots**	Make sure that you use paper that meets the specifications. Rough surface or thick media can cause the problem. If you still have the same problem and the **Drum** lamp is on, replace the drum unit with a new one.

Question	Recommendation
Toner scatters and stains the printed page.  **Fig. 6-11 Scattering Toner**	• If toner scatters over the whole printing surface, adjust the print density dial inside the printer counter clockwise. See "ADJUSTING THE PRINT DENSITY" in Chapter 5. • Clean the printer interior. See "Cleaning the Printer Interior and Drum Unit" in Chapter 5. • Make sure that you use paper that meets specifications. If you still have the same problem and the **Drum** lamp is on, replace the drum unit with a new one.
The whole page is printed in black.  **Fig. 6-12 Black Page**	Wipe the electric terminals referring to "Cleaning the Printer Interior and Drum Unit" in Chapter 5. Never use heat-sensitive paper as it will cause this problem. If you still have the same problem and the **Drum** lamp is on after cleaning, replace the drum unit with a new one.
Nothing is printed on the page.  **Fig. 6-13 White Page**	• Make sure that the toner cartridge is not empty. • Wipe the electric terminals referring to "Cleaning the Printer Interior and Drum Unit" in Chapter 5. • Make sure that a torn piece of paper does not remain on the scanner window.
Printed pages are marked at regular intervals.  **Fig. 6-14 Example of Regular Marking**	The problem may disappear by itself. Try printing multiple pages to clear this problem especially if the printer has not been used for a long time. If the surface of the drum has been scratched, replace the drum unit with a new one. If the problem does not disappear, it may be that the drum has been marked or damaged due to excessive exposure to light. In this case, replace the drum unit with a new one. If you still have the same problem after replacing the drum unit, consult your dealer or our authorized service representative.

Question	Recommendation
Printed pages are blurred at the center or either edge.  **Fig. 6-15 Blurred Page**	Certain environmental conditions such as humidity, high temperatures, etc. may cause this situation to occur. • Make sure that the printer is placed on a flat, horizontal surface. • Remove the drum unit with the toner cartridge installed. Try shaking them from side to side. • You may clear the problem by wiping the scanner windows with a soft cloth. (See "Cleaning the Printer Interior and Drum Unit.") If the same problem occurs after cleaning and **Drum** lamp is still on, replace the drum unit with a new one.
Ghost images show up on printed pages.  **Fig. 6-16 Ghost Images**	• Turn the print density dial counterclockwise for lighter images. See "ADJUSTING THE PRINT DENSITY" in Chapter 5. • Make sure that you use paper that meets the specifications. Rough surface or thick media can cause the problem. If you still have the same problem, consult your dealer or our authorized service representative.

Note
The drum unit is a consumable, and it is necessary to replace it periodically.

APPENDIX A

PRINTER SPECIFICATIONS

Printing

Print Method	Electrophotography by semiconductor laser beam scanning
Laser	Wavelength: 780 nm Output: 5 mW max
Resolution	1200 (H) x 600 (V) dots/inch (for Windows DIB graphics) 600 x 600 dots/inch (for Windows and DOS) 300 x 300 dots/inch (under Apple Macintosh using the optional RS-100M)
Print Quality	Normal printing mode Economy printing mode (up to 25% and 50% toner saving)
Print Speed	Up to 10 pages/minute (when loading A4 or letter-size paper from a multi-purpose sheet feeder) **NOTE**: Maximum print speed is obtained by printing several copies of the same page. Print speed may vary depending on interface type, emulation, processing power of the computer, memory allocated to the print job, paper size and graphic quality.
Warm-Up	Max. 30 seconds at 23°C (73.4°F) (The warm up time depends on the ambient temperature and humidity.)
First Print	15 seconds (when loading A4 or letter-size paper from the multi-purpose sheet feeder 1)
Print Media	Toner cartridge: Life Expectancy: 2,400 pages/new toner cartridge (when printing A4- or letter-size paper at 5% print coverage) **NOTE**: Toner life expectancy will vary depending on the type of average print job printed.

Drum Unit:
Life Expectancy: 20,000 pages at 20 pages per job
8,000 pages at 1 page per job

NOTE: There are many factors that determine the actual drum life, such as temperature, humidity, type of paper and toner that you use, the number of pages per print job, etc..

Functions

Emulation	Brother Printing Solution for Windows Automatic emulation selection among HP LaserJet 6P, BR-Script Level 2, EPSON FX-850 or IBM Proprinter XL
Printer Driver	Windows 3.1/3.11, Windows 95/98, and Windows NT 4.0 driver, supporting Brother Printing Solution for Windows, Brother Native Compression mode and bi-directional capability Optional Macintosh driver available for System 6.0.7 or higher
TrueType Fonts on disks	TrueType-compatible soft-fonts for Windows on the supplied disk
Interface	Bi-directional parallel Universal Serial Bus (USB) RS-422A/RS-232C serial interface RS-100M is optionally available.
Memory	4.0 MB Expandable up to 36 MB with one SIMM
Diagnostics	Self-diagnostic program

Electrical and Mechanical

Power Source	U.S.A. and Canada: Europe and Australia:	AC 110 to 120 V, 50 / 60 Hz AC 220 to 240 V, 50 Hz
Power Consumption	Printing: Stand-by: Sleep:	280 W or less 60 W or less 13 W or less
Noise	Printing: Stand-by:	49 dB A or less 38 dB A or less
Temperature	Operating: Storage:	10 to 32.5°C (50 to 90.5°F) 0 to 40°C (38 to 104°F)
Humidity	Operating: Storage:	20 to 80% (without condensation) 10 to 85% (without condensation)
Dimensions (W x D x H)	402 x 439 x 274 mm (15.8 x 17.3 x 10.8 inches) (when the output tray is closed.)	
Weight	Approx. 9.6 kg (21.2 lb.) including the drum unit and toner cartridge	

PARALLEL INTERFACE SPECIFICATIONS

> **Note**
> To ensure the highest quality performance, it is recommended that you use an IEEE 1284 compliant parallel cable between the printer and your computer. Only IEEE 1284 cables support all of the advanced printing capabilities, such as bi-directional communication. These cables will be clearly marked with "IEEE-1284".

Interface Connector Printer Side: Amphenol FCN-685J036-L/X or equivalent
A shielded cable should be used.

Pin Assignment

Pin No.	Signal	Direction	Pin No.	Signal	Direction
1	$\overline{\text{DATA STROBE}}$	Input	19	0V (S.G.)	–
2	DATA 1	Input	20	0V (S.G.)	–
3	DATA 2	Input	21	0V (S.G.)	–
4	DATA 3	Input	22	0V (S.G.)	–
5	DATA 4	Input	23	0V (S.G.)	–
6	DATA 5	Input	24	0V (S.G.)	–
7	DATA 6	Input	25	0V (S.G.)	–
8	DATA 7	Input	26	0V (S.G.)	–
9	DATA 8	Input	27	0V (S.G.)	–
10	$\overline{\text{ACKNLG}}$	Output	28	0V (S.G.)	–
11	BUSY	Output	29	0V (S.G.)	–
12	PE	Output	30	0V (S.G.)	–
13	SLCT	Output	31	$\overline{\text{INPUT PRIME}}$	Input
14	$\overline{\text{AUTO FEED}}$	Input	32	$\overline{\text{FAULT}}$	Output
15	N.C.	–	33	N.C.	–
16	0V (S.G.)	–	34	N.C.	–
17	0V (S.G.)	–	35	N.C.	–
18	+5V	–	36	$\overline{\text{SLCT IN}}$	Input

Note
To use bi-directional communication, an interface cable which has the pin connections above must be used.

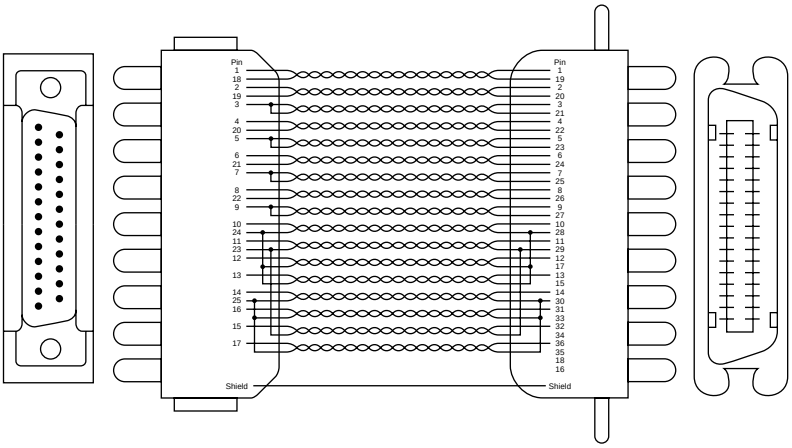
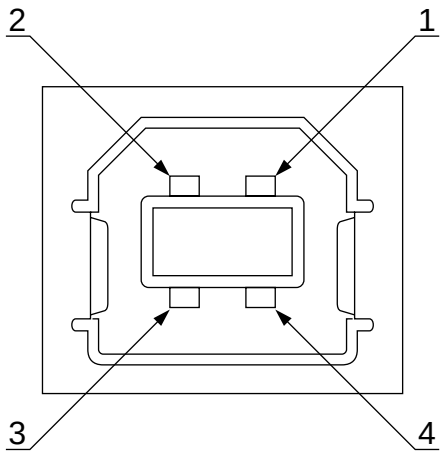


Fig. A-1 Parallel Interface Cable

Universal Serial Bus (USB) Interface

Interface Connector



Pin Assignment

Pin No.	Signal	
1	Vcc (+5V)	
2	- Data	Serial Data -
3	+ Data	Serial Data +
4	Ground	

RESIDENT FONTS

75 Scalable and 12 Bitmapped Fonts

This printer has the following scalable fonts and bitmapped fonts. The fonts that can be used vary according to the current emulation mode.

■ HP LaserJet, EPSON FX-850, and IBM Proprinter XL Modes

Scalable Fonts:

Intellifont Compatible Fonts:
- Alaska, Extrabold
- Antique Oakland, Oblique, Bold
- Brougham, Oblique, Bold, BoldOblique
- Cleveland Condensed
- Connecticut
- Guatemala Antique, Italic, Bold, BoldItalic
- Letter Gothic, Oblique, Bold
- Maryland
- Oklahoma, Oblique, Bold, BoldOblique
- PC Brussels Light, LightItalic, Demi, DemiItalic
- PC Tennessee Roman, Italic, Bold, BoldItalic
- Utah, Oblique, Bold, BoldOblique
- Utah Condensed, Oblique, Bold, BoldOblique

Microsoft Windows 3.1/95/98 TrueType

Compatible Fonts:
- BR Symbol
- Helsinki, Oblique, Bold, BoldOblique
- Tennessee Roman, Italic, Bold, BoldItalic
- W Dingbats

Type 1 Font Compatible Fonts:
- Atlanta Book, BookOblique, Demi, DemiOblique
- Calgary MediumItalic
- Copenhagen Roman, Italic, Bold, BoldItalic
- Portugal Roman, Italic, Bold, BoldItalic

Brother Original Fonts:
- Bermuda Script
- Germany
- San Diego
- US Roman

Bitmapped Fonts (Portrait and Landscape):
- LetterGothic16.66 Medium, Italic, Bold, BoldItalic
- OCR-A
- OCR-B

■ BR-Script 2 Mode

Scalable Fonts:
• Atlanta Book, BookOblique, Demi, DemiOblique
• Alaska, Extrabold
• Antique Oakland, Oblique, Bold
• Bermuda Script
• BR Dingbats
• BR Symbol
• Brougham, Oblique, Bold, BoldOblique
• Brussels Light, LightItalic, Demi, DemiItalic
• Calgary MediumItalic
• Cleveland Condensed
• Connecticut
• Copenhagen Roman, Italic, Bold, BoldItalic
• Germany
• Guatemala Antique, Italic, Bold, BoldItalic
• Helsinki, Oblique, Bold, BoldOblique
• Helsinki Narrow, Oblique, Bold, BoldOblique
• Letter Gothic, Oblique, Bold
• Maryland
• Oklahoma, Oblique, Bold, Bold Oblique
• Portugal Roman, Italic, Bold, BoldItalic
• San Diego
• Tennessee Roman, Italic, Bold, BoldItalic
• US Roman
• Utah, Oblique, Bold, BoldOblique
• Utah Condensed, Oblique, Bold, BoldOblique

SYMBOL SETS/ CHARACTER SETS

OCR Symbol Sets

When the OCR-A or OCR-B font is selected, the corresponding symbol set is always used.

- OCR-A
- OCR-B

HP LaserJet 6P Mode

- Roman 8 (8U)
- ISO Latin1 (0N)
- ISO Latin2 (2N)
- ISO Latin5 (5N)
- ISO Latin6 (6N)
- PC-8 (10U)
- PC-8 D/N (11U)
- PC-850 (12U)
- PC-852 (17U)
- PC-775 (26U)
- PC-1004 (9J)
- PC-8 Turkish (9T)
- Windows Latin1 (19U)
- Windows Latin2 (9E)
- Windows Latin5 (5T)
- Windows Baltic (19L)
- Legal (1U)
- Ventura Math (6M)
- Ventura Intl (13J)
- Ventura US (14J)
- PS Math (5M)
- PS Text (10J)
- Math-8 (8M)
- Pi Font (15U)
- MS Publishing (6J)
- Windows 3.0 (9U)
- Desktop (7J)
- MC Text (12J)
- Symbol (19M)
- Windings (579L)
- ISO2 IRV
- ISO4 UK
- ISO6 ASCII
- ISO10 Swedish
- ISO11 Swedish
- ISO14 JIS ASCII
- ISO15 Italian
- ISO16 Portuguese
- ISO17 Spanish
- ISO21 German
- ISO25 French
- ISO57 Chinese
- ISO60 Norwegian1
- ISO61 Norwegian2
- ISO69 French
- ISO84 Portuguese
- ISO85 Spanish
- HP German
- HP Spanish

EPSON Mode

- US ASCII
- PC-8
- PC-8 D/N
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- PC-8 Turkish
- German
- UK ASCII I
- French I
- Danish I
- Italy
- Spanish
- Swedish
- Japanese
- Norwegian
- Danish II
- UK ASCII II
- French II
- Dutch
- South African

IBM Mode

- PC-8
- PC-8 D/N
- PC-850
- PC-852
- PC-860
- PC-863
- PC-865
- PC-8 Turkish

> **Note**
> If you want to know what characters are in each symbol/character set, print `CHARASET.PRN` file from the "Print form" option in the Direct Access Menu of the Remote Printer Console Program.

❑ HP LaserJet 6P

Roman 8

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				¯	â	Å	Á	Þ
1			!	1	A	Q	a	q				À	Ý	ê	î	Ã	þ
2			"	2	B	R	b	r				Â	ý	ô	Ø	ã	·
3			#	3	C	S	c	s				È	°	û	Æ	Đ	µ
4			$	4	D	T	d	t				Ê	Ç	á	å	ð	¶
5			%	5	E	U	e	u				Ë	ç	é	í	Í	¾
6			&	6	F	V	f	v				Î	Ñ	ó	ø	Ì	-
7			'	7	G	W	g	w				Ï	ñ	ú	æ	Ó	¼
8			(	8	H	X	h	x				´	¡	à	Ä	Ò	½
9			)	9	I	Y	i	y				`	¿	è	ì	Õ	ª
A			*	:	J	Z	j	z				^	¤	ò	Ö	õ	º
B			+	;	K	[	k	{				¨	£	ù	Ü	Š	«
C			,	<	L	\	l	|			~	¥	ä	É	š	■
D			-	=	M	]	m	}				Ù	§	ë	ï	Ú	»
E			.	>	N	^	n	~				Û	ƒ	ö	ß	Ÿ	±
F			/	?	O	_	o	▒				£	¢	ü	Ô	ÿ	

ISO Latin1

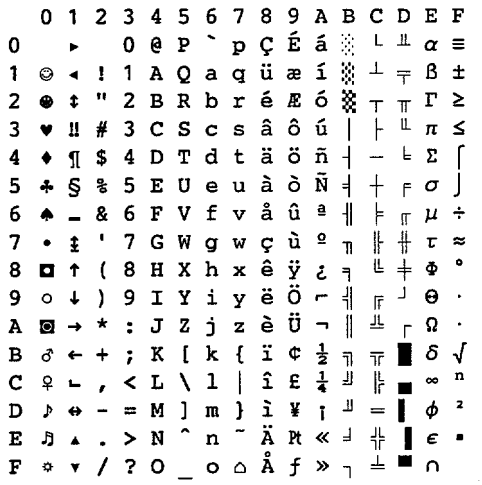
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0				0	@	P	`	p				°	À	Ð	à	ð
1			!	1	A	Q	a	q			¡	±	Á	Ñ	á	ñ
2			"	2	B	R	b	r			¢	²	Â	Ò	â	ò
3			#	3	C	S	c	s			£	³	Ã	Ó	ã	ó
4			$	4	D	T	d	t			¤	´	Ä	Ô	ä	ô
5			%	5	E	U	e	u			¥	µ	Å	Õ	å	õ
6			&	6	F	V	f	v			¦	¶	Æ	Ö	æ	ö
7			'	7	G	W	g	w			§	·	Ç	×	ç	÷
8			(	8	H	X	h	x			¨	¸	È	Ø	è	ø
9			)	9	I	Y	i	y			©	¹	É	Ù	é	ù
A			*	:	J	Z	j	z			ª	º	Ê	Ú	ê	ú
B			+	;	K	[	k	{			«	»	Ë	Û	ë	û
C			,	<	L	\	l	|		¬	¼	Ì	Ü	ì	ü
D			-	=	M	]	m	}			-	½	Í	Ý	í	ý
E			.	>	N	^	n	~			®	¾	Î	Þ	î	þ
F			/	?	O	_	o	▒			¯	¿	Ï	ß	ï	ÿ

The following table shows characters available only in the corresponding character set. The numbers at the top of the table are code values with which characters are to be replaced in the Roman 8 character set. For other characters, see the Roman 8character set.

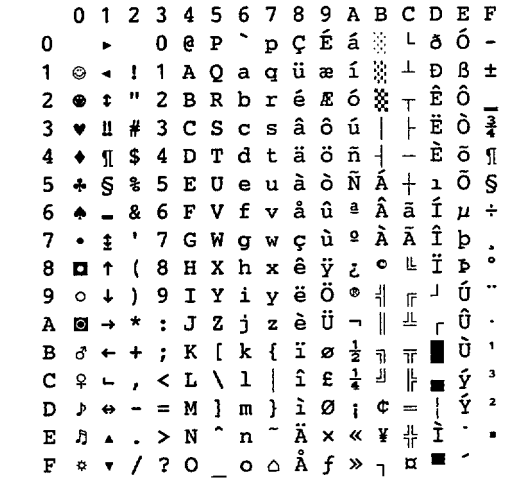
SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
ISO2 IRV	#	¤	@	[	\	]	^	`	{	|	}	¯
ISO4 UK	£	$	@	[	\	]	^	`	{	|	}	¯
ISO6 ASCII	#	$	@	[	\	]	^	'	{	|	}	~
ISO10 Swedish	#	¤	@	Ä	Ö	Å	^	`	ä	ö	å	¯
ISO11 Swedish	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
ISO14 JIS ASCII	#	$	@	[	¥	]	^	`	{	|	}	¯
ISO15 Italian	£	$	§	°	ç	é	^	ù	à	ò	è	ì
ISO16 Portuguese	#	$	§	Ã	Ç	Õ	^	`	ã	ç	õ	°
ISO17 Spanish	£	$	§	¡	Ñ	¿	^	`	°	ñ	ç	~
ISO21 German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
ISO25 French	£	$	à	°	ç	§	^	`	é	ù	è	¨
ISO57 Chinese	#	¥	@	[	\	]	^	`	{	|	}	¯
ISO60 Norwegian1	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	¯
ISO61 Norwegian2	§	$	@	Æ	Ø	Å	^	`	æ	ø	å	|
ISO69 French	£	$	à	°	ç	§	^	µ	é	ù	è	¨
ISO84 Portuguese	#	$	´	Ã	Ç	Õ	^	`	ã	ç	õ	~
ISO85 Spanish	#	$	·	¡	Ñ	Ç	¿	`	´	ñ	ç	¨
HP German	£	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
HP Spanish	#	$	@	¡	Ñ	¿	°	`	{	ñ	}	~

❑ HP LaserJet 6P, EPSON FX-850, IBM Proprinter XL

PC-8

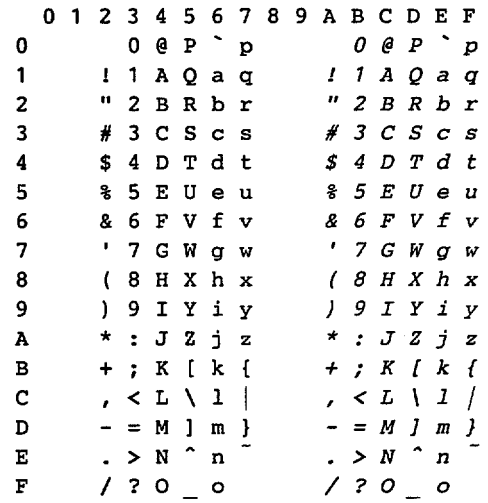


PC-850



❑ EPSON FX-850

US ASCII



The following table shows characters available only in the corresponding character set. The numbers at the top of the table are code values with which characters are to be replaced in the US ASCII character set. For other characters, see the US ASCII character set.

SYMBOL SET	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E
German	#	$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß
UK ASCII I	£	$	@	[	\	]	^	`	{	|	}	~
French I	#	$	à	°	ç	§	^	`	é	ù	è	¨
Danish I	#	$	@	Æ	Ø	Å	^	`	æ	ø	å	~
Italy	#	$	@	°	\	é	^	ù	à	ò	è	ì
Spanish	₧	$	@	¡	Ñ	¿	^	`	¨	ñ	}	~
Swedish	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Japanese	#	$	@	[	¥	]	^	`	{	|	}	~
Norwegian	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
Danish II	#	$	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
UK ASCII II	#	£	@	[	\	]	^	`	{	|	}	~
French II	#	â	à	î	ç	ê	û	ô	é	ú	è	ï
Dutch	#	$	@	[	]	ƒ	^	`	é	ij	è	¨
South African	#	ê	É	Ê	Ö	è	Ü	é	ë	ö	ô	ü

INDEX

A

Alarm lamp 3–3, 6–1
APT..... 3-6
auto-emulation switching.....1–4

B

baud rate 4–3
bitmapped font.....A–7

C

character set A–9
control panel 1–2, 3–1
cover open 6–2
cut sheet 2–1

D

data compression technology.....1–5
Data lamp.....3–2
data length 4–3
DIP switch 1–2, 4–3
DOS 6–11
dpi.....1–3
Drum lamp.....3–2
drum unit 5–6
  life.....A–2
DTR 4–3
duplex printing.....2–8

E

economy mode.....1–5
emulation 1–4, A–2
envelope.....2–1
error
  message.....6–2
  recoverable.....6–1
  unrecoverable.....6–4
extension support wire.....1–2

F

Feeder 2 lamp 3–2

H

hex dump print.....3–5

I

interface A–2
  error 6–2

J

jammed paper 6–5

L

label 2–1

M

Macintosh 6–12
manual feed slot.....1–2, 2–9
memory.....A–2
  full 6–2
  SIMM 4–7
misfeed 6–1
multi-purpose sheet feeder 1–2, 2–5
  capacity.....2–1

O

operator call.....6–1,6–2
organizer.....2–1
output tray.....1–2, 2–11
  capacity.....2–1

P

page protection 3-5
paper
  capacity.....2–1
  empty 6–1
  jam 6–1, 6–5
  recommended 2–2
  size.....2–1
  type 2–1

paper feed roller....5–15
paper guide....1–2
Paper lamp....3–1, 6-1
paper stopper....1–2
paper support....1–2
parallel interface
  pin assignment....A–4
  port....1–2
parity....4–4
post card....2–1
power cord....1–2
power switch....1–2
ppm....1–3
primary corona wire....5–14
print
  density....5–10
  method....A–1
  overrun....6–2
  quality....A–1
  speed....A–1
Print Config....3–5
Print Fonts I....3–5
printable area....2–3
printer driver....A–2
printer status monitor....1–4
protocol....4–3

R

Ready lamp....3–1
Remote Printer Console....1–4
resolution....1–3, A–1
robust....4–3
RPC....1–4
RS-232C....4–2
RS-422A....4–2

S

scalable font....A–7
scanner window....5–13
serial interface....4–1
  cable....4–4
  parameter....4–3
  RS-422A/RS-232C port....1–2
service call....6–4
SIMM....4–7
sleep mode....1–5, 3–4
slide switch....1–2, 4-2
starter sheet....5–9
stop bit....4–3
switch....3–3
symbol set....A–9

T

test print mode....3–4
test sample page....3–5
time-out....3–4
toner
  empty....6–1
  low....6–1
toner cartridge....5–1
  life....A–1
Toner lamp....3–2, 6–1
top cover....1–2
transparency....2–1

U

universal serial bus pin assignment....A-6

W

warm-up....A–1
Windows....6–10

X

Xon/Xoff....4–3